

Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY, AND DAILY EIGHT TIMES IN JUNE, BY
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada	6.00
Foreign Edition (London).....	£1 12s. (\$8.00)
Single Copies	15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, \$1.50; Canada, \$2.00; Foreign, \$3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOLUME 50.

FRIDAY, FEBRUARY 10, 1911.

NUMBER 6.

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ON February 1 E. T. Howson became a member of the editorial staff of the *Railway Age Gazette*, with direct supervision over the maintenance of way department. Mr. Howson comes to us from the Chicago, Burlington & Quincy, where he has been engaged in engineering work for about five years. He received his engineering education at the University of Wisconsin, and while a student there was editor of the *Wisconsin Engineer*, which is published by the students in the engineering college. He graduated in 1906 and was assistant engineer on reconstruction on the Burlington in southern Illinois for a year. He was then in maintenance work in both office and field for two years. His last service with the Burlington was as division engineer of the La Crosse division in charge of important terminal and double track work as well as maintenance of way. He will make his headquarters at our Chicago office.

THE writer of the articles on The Mistakes of the Efficiency Men, who is so severely criticised in a communication in this issue, was engaged to prepare the series of articles not because he was opposed to the principles of scientific management, for he is not, but because of his intimate practical contact with

efficiency engineers and also his previous extensive experience in effecting economies in railway service. He has no intention of quarreling with the correctness of the principles of efficiency. He believes in them and his criticisms of the efficiency engineer, which are based on actual experience, must therefore carry all the more weight. A few managers of industrial plants have realized the force of the principles of scientific management and have retained efficiency engineers, sometimes with splendid results when the work was carried on under the supervision of a good, practical manager, but often with poor results when a close check was not kept on the engineer. In some instances the efficiency engineer has had untrained and inexperienced young men as his staff. Probably he realized more fully than anybody else the handicap he was laboring under, but where could he find the right kind of men to do this work? They must be carefully trained and developed, and it takes time to do this. The practical shop demonstrator or foreman with a plentiful supply of common sense is far more apt to make a correct schedule than most of these inexperienced young men, and, after all, the most important factor in making schedules for railway repair work is common sense and good judgment. There is a great difference between such work and the manufacturing of new material, even though the underlying principles governing their performance are the same. The bonus system may accomplish good results; so does piecework when properly handled. One of the most efficient railway shops in this country is operated on the day work plan. The main thing is to have a system such that the management will know exactly what a fair day's work should be and that the men will be given an incentive in some form or other to put forth their best efforts as concerns both quality and quantity of output. If these things are accomplished the method of payment is immaterial. Conditions at one shop may demand one system, while those at another may require a radically different treatment. The prominence which has been given the subject of scientific management means much to the railways, not because it has focused attention on the efficiency engineers who have formulated its principles, but because of the effect which must result from a realization of its possibilities on the part of the army of railway officers and foremen who are studying it. It is, however, important that they profit by the mistakes of the efficiency engineers.

THE government accident bulletin which is reprinted in this issue is the first one under the new law, which brings all accidents into the quarterly records, including highway crossing cases, trespassers, employees off duty, etc. The classification has been modified in some respects. For those classes of accidents in which the public takes the most interest comparisons can be made the same as in the past, but in the final totals comparison with former periods is practically out of the question, for these, besides being greatly increased by the addition of the new classes mentioned, are also decreased by the omission of "industrial accidents," which the commission has decreed shall no longer be called railway accidents. In table No. 1, however, the industrials are shown at the bottom, so that after all the only important difference produced by their exclusion is that the railways (as appears from the circular of instructions) are relieved from the duty of reporting their causes and circumstances in detail. But the present record is appalling, in whatever way one looks at it. The only reason that we are not really appalled is that we have become hardened. This, indeed, is largely inevitable, for no mind can bear the burden of even one branch of the sorrows of 80 millions of people. Moreover, the railways are not the only subjects of reflections of this kind. The records of accidents in mines, or at sea, furnish similar suggestions. The annual report of the coroner of New York City, recently issued, contains a lot of striking facts which will serve to modify quite materially the views of anyone who thinks that the car of Juggernaut runs only on standard gage railways. In the notes on causes of

prominent train accidents this bulletin presents a notable list, no less than six bad disasters having happened in the quarter under review. The collision (No. 20) which occurred at Durand, Mich., in August, is described quite fully; and the facts, as here given, expose the mischievous character of the official and unofficial comments, evidently ignorant or prejudiced, which were so freely published in the Michigan newspapers at the time of the coroner's investigation. Concerning the other notable accidents the facts given in the bulletin add little to what has been published already. These others, so far as we can identify them are: Ignacio, California (August), No. 22; Middletown, Ohio (July), No. 24; Fort Wayne & W. V. Electric (September), No. 25; Dellvale (Clayton), Kan., derailment No. 9; Analomink, Pa. (August), derailment No. 23. Perhaps the most interesting collision case is that numbered 3; disclosing a combination of three negligent telegraphers and a controlled-manual block-signal apparatus that was not used.

SOME FACTS ABOUT MAIL PAY.

THE committee on railway mail pay, Julius Kruttschnitt, chairman, has made an interesting study of the complicated and confusing subject with which it has to deal, and we give in another column an abstract of a pamphlet which has been issued showing some of the results. This is a real "report of progress," for it has been difficult heretofore to get much definite useful information on this subject. But on the question of how the railways' claims shall be impressed on the postmaster general or Congress there does not appear to have been much progress. On this point the committee does not enlighten us. The "small roads," which means those—not always extremely small in mileage—that carry a very small quantity of mail, presented their case to the House post office committee in a pamphlet last month, but we do not learn that there is any hope of action by Congress at the present session.

The general situation is extremely illogical, and has been so for years. Like the two cent charge for letters or the one cent a pound for newspapers, the rate paid the railways is admittedly based on the crudest possible averages. On letters, weighing a fourth of an ounce, or on a charge for disseminating knowledge for the general public welfare, the injustice inseparable from a crude basis is not burdensome, but an injustice which mounts up to the value of thousands of ton miles, as this does in the cases of many railways, cannot so easily be put aside as negligible. Space for assorting letters is properly chargeable for, as space, because it cannot be used to carry lading, and for the government to pay for a 50 ft. car while compelling the railway to furnish for nothing a 35 ft. car (where a longer one is not needed) has no rational basis except on the theory that might makes right. In their second request—for relief from carrying the mail from stations to post offices—the railways are illogical, for this burden bears just as heavily in proportion on the large roads as on the smaller ones. But it is a condition, not a theory, that confronts them; and their position, we understand, is that the smaller roads in many cases actually sustain important losses on this service, while the larger roads, carrying several times as much mail, can absorb the loss with more show of reason. To ask that the prices for transportation be readjusted as often as there is a material change in the quantity of mail carried (third request) is so reasonable that the point needs no argument.

So far as we can learn, the only answer that is made to the railways' claim of unreasonableness in details, is that as a whole, the railways receive more than they ought to receive. Even so, there is no reason for continuing inequitable rates when a basis which is equitable can be found. Two wrongs do not make a right. It looks as though the postmaster general, through successive administrations, had simply aimed to reduce the railways' total compensation—which he looks upon as a public spirited purpose—in any way that is possible and that is

technically within the law. Where a 60 ft. car makes a 300-mile run the department makes no bones of deciding that for a part of the run, say 50 or 100 miles, a length of only 50 ft. is needed and only that length will be paid for; a decision that could be justified only on the assumption that it would be economical to devise such a run and use for it two separate cars. Such a narrow minded policy should be beneath the dignity of a department of the government. If the railways are being paid too much the fair way to reduce the prices is to vote a reduction openly in Congress.

But there is no evidence, after all, that the railways receive too much. It must be that some roads make a good profit on mail carrying, for we see them every now and then racing with each other to see which can find most favor with the post office department; but taking the railway system of the country as a whole, the committee shows that the railways receive for the mails less per linear foot of car space than is received for passengers; and no reasonable person has ever claimed that the passenger service is excessively profitable. On the contrary, it is conducted at a loss on many thousands of miles of road, and its continuance is justified only on the ground that the public must have the service and is able to reimburse the railways, wholly or partly, by furnishing loads for freight trains. A few roads in thickly settled districts have made money on passengers, and it is true that in some cases a reduction of fares has increased the net receipts; but the fact remains that almost everywhere the freight service has to bear a part of the cost of maintaining the passenger service. There is no good reason why this burden should be increased for the benefit of the mail service. Each service should bear its own burdens, as nearly as practicable.

Unless the facts which are set forth by this committee can be impeached it would appear that the railways have made out a pretty good case.

THE LOCOMOTIVE BOILER INSPECTION LEGISLATION.

THE federal locomotive boiler inspection bill, which passed the Senate on January 10 and the house on February 7, is very different from the earlier measures introduced in Congress dealing with this subject. For example, Bill H. R. 9786, which was presented at the first session of the sixty-first Congress, prescribed specifically various devices with which locomotive boilers must be equipped; provided that each should withstand a hydrostatic test in the ratio of 150 lbs. to the square inch to 100 lbs. to the square inch of the working steam power allowed; and made other detailed requirements regarding boiler construction and operation. It provided that the secretary of commerce and labor should, in such manner and under such rules as might be prescribed by him, once in every three months, at least, order a careful inspection of each boiler, and authorized any inspector who was not satisfied that a boiler was safe to compel the locomotive to be taken out of service. In other words, it arbitrarily fixed the standards, put the entire duty of inspection in the first instance on the government, and left the railway managers with almost no discretion to determine how boilers should be constructed or equipped, or how or when they should be inspected. Bill S. 6702, as it was originally introduced at the second session of the sixty-first Congress, contained substantially similar, but very much more elaborate and detailed, provisions, and its adoption would have required the employment by the government of 300 inspectors.

On the other hand, the bill which has now been passed by both houses (S. 6707) does not prescribe in detail how boilers shall be built and equipped, but merely forbids the railways to use locomotives unless the boilers and the appurtenances thereof are in proper condition and safe to operate, and unless they shall be inspected from time to time in accordance with the provisions of the act. Inspections are to be made by the railways according to rules and instructions to be prepared in the first instance by themselves, but which shall be subject to approval and modifi-

cation by the Interstate Commerce Commission, which may itself prepare rules and instructions for any road that fails to prepare and file them with the commission. There are to be appointed one chief inspector and two assistant chief inspectors, and the country is to be divided into 50 districts, in each of which there shall be one inspector who shall be in the classified service and be appointed through the civil service commission. The railways are required to file with the inspector of the district in which a locomotive is operated a sworn report of each inspection and a sworn statement as to the repairs made of defects disclosed by the inspection. A district inspector may order any locomotive out of service if he finds its boiler or apparatus pertaining thereto not in serviceable condition; but the railway may appeal at once from his order to the chief inspector and from the chief inspector to the Interstate Commerce Commission. Pending the appeal the orders of the inspector must be obeyed. In case of accident resulting from failure of a locomotive boiler or its appurtenances causing serious injury or death, the railway shall make a report to the chief inspector, the accident shall be investigated by a government official, and the results of the investigation shall be made public in such manner as the Interstate Commerce Commission may deem proper.

It will be seen that this measure puts the responsibility, in the first instance, for seeing that boilers are properly made and inspected where it belongs—that is, on the railway. The government will not attempt to supersede the railway management in the performance of a duty properly belonging to the latter, but will merely exercise supervision to see that the railway management performs its duty. Under any of the earlier bills there would have been duplication of inspection, the function being performed by both the railways and the government. Under the later measure there will be little or no more duplication than is necessary if the government is to make sure that the railway is complying with the requirements of the law. The results will be better than would have been obtained by the enactment of one of the earlier measures; and the securing of them probably will cost both the government and the railways less.

That arbitrary and unwise legislation has been prevented and that a fairly satisfactory law has been enacted are due mainly to the fact that the railways, while vigorously opposing the earlier bills, did not oppose all legislation on the subject, as they often have done when measures for the regulation of other matters were pending, but merely insisted that any legislation that might be passed should be fair and wise, and tendered the services of their experts to aid in drafting a good bill. Representatives of the Special Committee on Relations of Railway Operation to Legislation held several conferences with representatives of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors and the Brotherhood of Railroad Trainmen. These conferences led to the various points of difference between the representatives of the employees and the representatives of the railways being settled or compromised with the result that the measure finally passed went to Congress with the endorsement of H. E. Wills, the legislative agent of the brotherhoods, and F. O. Melcher, the chairman of the Special Committee on Relations of Railway Operation to Legislation.

Public men often have complained that when bills affecting railways have been pending before state legislatures or Congress, the roads have sent to appear before the committees to which the measures were referred their legislative agents, usually attorneys, who had no authority to suggest any modifications in them but could merely oppose them. It has been said that if the railways would send to the state and the national capitals responsible officers possessing practical knowledge of the matters involved, and authority to say what modifications in the proposed measures would be acceptable to the railways, fewer arbitrary and harmful measures would be passed. The experience with the boiler inspection legislation shows that there has been ground for these criticisms of the policy often followed by the

railways. The same thing may be said of the results of the conferences between representatives of the railways, representatives of the employees, and the safety appliance inspectors of the Interstate Commerce Commission regarding recommendations to be made for modifications of the standards prescribed by the commission for safety appliances on new cars and for extensions of the time within which the roads must put these appliances on old equipment. In both cases the roads have gained by a policy of firm but conciliatory negotiations more than in any case in recent years they have gained by a policy of mere opposition.

NEW BOOKS.

Metal Statistics. 208 pages, 3½ in. x 6 in. Cloth. American Metal Market Co., New York.

The 1911 edition of this work contains a better selection of statistical information relating to the metal and iron and steel trades than any of the previous issues. The figures are presented in such a clear and concise form that it is very convenient for reference. The statistics cover the production, consumption and price movements of all metal and iron and steel products for a series of years. Unusual care has been taken to include only such figures as have been proved reliable. The iron and steel section has been entirely revised under the supervision of B. E. V. Luty, Pittsburgh, Pa., and several new features of original character have been introduced, including composite pig iron and composite finished steel. Among the various copper statistics is a table showing the total production of this metal from 1800 through 1910, which sets forth graphically the tremendous strides that have been made in this country within the last ten years particularly.

Self Taught Mechanical Drawing and Elementary Machine Design. By F. L. Sylvester, M.E., with additions by Erik Oberg. 320 pages; 5 in. x 7½ in.; cloth. The Norman W. Henley Publishing Company, New York. Price, \$2.00.

In this elementary treatise the aim of the author has been to adapt the work to the requirements of the practical mechanic and young draftsman, and to present the subject in such a simple manner that it may be easily studied without a teacher. The first part contains simple lessons in mechanical drawing, followed by easy lessons in mathematics, pertaining to the problems in machine design that are presented later. The last part treats of strength of materials and the elements of machine design. The chief merit of the book is the consistent level maintained throughout. In none of the parts relating to mechanics, mathematics or strength of materials is a technical education necessary to understand the formulae presented, and the capacity of the shop apprentice who has not had this advantage is constantly kept in view. The book is likely to prove useful to many young apprentices who are not technical graduates and have not attended manual training schools.

Elements of Electricity for Technical Students. By W. H. Timbie, instructor in industrial electricity, Pratt Institute. 556 pages; 5¼ in. x 7¾ in.; cloth. John Wiley & Sons, New York. Price, \$2.00.

The author has had an extensive teaching experience on this subject and the book is based on lecture notes used for several years in the classes of applied and industrial electricity at the Pratt Institute of Brooklyn, N. Y. These notes have given good results in preparing the students for more advanced study as well as for practical work. The chief merits of the book are: First, it contains an adequate amount of information concerning electrical laws in shape for immediate use. Second, it applies the information to existing conditions and not to abstract them. Third, it gives such a drill in practical problems that an additional amount of profitable information is obtained, and it develops in the student a capacity for applying what he has learned, the large number of diagrams aiding materially in providing exact and clean-cut conceptions of the problems. Fourth, the book presents only those facts and principles that the technical student needs to know, history and general theory being omitted. The text is an adequate treatment of a few funda-

mental ideas rather than a profuse treatment of many; yet it constitutes a well-rounded course for the man who is to receive no further electrical education. A knowledge of common school arithmetic and the simplest algebra is required to study the book satisfactorily. It is especially adapted for use in the short practical courses given in trade, industrial and technical high schools, but at the same time would afford sufficient preparation for the theory and practice of electricity as taught in colleges and universities.

Letters to the Editor.

NICKEL AND CHROME ALLOYS FOR CHILLED IRON CAR WHEELS.

PITTSBURGH, PA., February 2, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The best steel used for wearing surfaces in automobiles has nickel and chrome in it, the nickel to give increased tensile strength and toughness of surface, and the chrome to give hardness of surface. The necessity of an alloy of some kind for chilled car wheels is evident from the fact that all known kinds of pig iron and scrap have been used without success in the endeavor to make an improved chilled iron car wheel. Such makers as the Pennsylvania Railroad and the Norfolk & Western would not be seeking a better car wheel mixture, if the present mixtures were good enough.

Nickel and chrome are the least expensive and best known alloys on the market. They are the only ones that meet the difficulty of increased combined carbon in a remelted chilled car wheel. This is the troublesome element in the present mixture, and must be recognized and regulated if an improved chilled car wheel is to be made. The chemical, mechanical and service tests showing that these alloys will remedy all this difficulty and enable chill wheel foundries to continue their present foundry practice, and the railways to buy a reliable, inexpensive car wheel, as they have heretofore been doing, have all been made by the actual use of such wheels under 50-ton steel cars for nearly two years; these cars run 60,000 miles in that time, or equal to seven years of ordinary freight car mileage.

Two special mechanical tests have also been made with the following results: Under hydraulic flange pressure the nickelized car wheel gave way under 90,000 lbs. A standard chilled iron car wheel flange gave way at 54,000 lbs., showing 66 per cent. in favor of the nickelized wheel. Under the drop flange test, introduced by the Lobdell Car Wheel Company, consisting of a weight of 21 lbs. dropped 14 ft., the nickelized wheel flange stood 37 blows, while standard chill wheels on the same test block broke at an average of 12 blows, showing an advantage of over 300 per cent. in favor of the nickelized wheel. It is believed that the ordinary chilled car wheel flange will not stand 5 blows. These tests are of special interest when it is remembered that the weak point in the ordinary chilled car wheel is the flange. The rolled and forged steel wheels have been introduced, notwithstanding their acknowledged deficiency in wearing qualities and expensive re-turning, solely because they are stronger in the flange than the ordinary chilled wheel. The above tests show that the use of nickel removes this difficulty, and that a stronger flange can be obtained at one-third the cost of a steel wheel on the basis of cost per 1,000 miles. This drop flange test, although it has not yet been adopted by the M. C. B. Association, will commend itself to all engineers of tests. The action of the falling weight on the inside of the flange gives a shock similar to that which the flange is subjected to in service.

~ The tests described show 300 per cent. advantage in strength of flange of the nickelized chilled car wheel over the ordinary

car wheel. The steel wheel makers claim an advantage in this respect of 500 per cent., but if 300 per cent. is sufficient, as proven by the use of the nickelized wheels on 50-ton steel cars making a mileage of 60,000, why pay three times as much for an unnecessary advantage? To give a humorous illustration, suppose a man wanted his nose lengthened $\frac{1}{4}$ in. and found a surgeon that would do the job for \$1,000. Would he be likely to prefer a surgeon who told him that he would not put on less than $\frac{3}{4}$ in., but would do it for \$3,000. The patient might object that the extra half inch was very unnecessary, and very expensive.

Where the surface of the tread is made tougher by the addition of nickel and harder by the addition of chrome an increase in mileage follows as a matter of course. From actual results in the use of alloys, a guarantee of 80,000 to 90,000 miles can be given at an expense of one-third the steel wheel, and 30 per cent. less than the cost of the present ordinary chilled wheel on the basis of cost per 1,000 miles.

ROBERT C. TOTTEN.

SCIENTIFIC MANAGEMENT.

PORT CHESTER, N. Y., February 5, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

It is inconceivable that the writer of *The Mistakes of Efficiency Men*, in your issue of February 3, page 230, could ever have worked "with them," for he shows such a lamentable ignorance of their fundamental principles. Ordinarily such writers may be left to hang themselves, but as scientific management is now on the tapis and is so imperfectly understood in many quarters I feel impelled to criticize most of the article. Will the writer kindly give an instance which justifies his saying, "Failure of many of their theories when brought to the test of practical application"? The principles of scientific management are based on truisms and must be as true in practice as in theory; when failure occurs it will inevitably be found that it is caused by a violation of principle and not through fault of principle.

For a writer who claims to have "worked with them" to ask how the efficiency of a workman is arrived at, and then to go on and give an entirely erroneous account of how it is done is to say the least surprising. cursory observation readily detects lost time in any operation; the operator stops to talk, to go on an errand, to look for material, etc. It is easy to see that waste motions are being made, that the speed is slow and to locate innumerable causes that restrict output, so that when he says: "Time studies are made, often with the assistance of a stop watch, by inexperienced men of little tact—students and others equally incapable," he writes himself down as one wholly misconceiving the situation. A trained observer, though he may know little about the particular operation which he is observing, can readily detect the wastes and keep account of them, the stop watch being merely an assistance in fixing the time; when this is done it is only the beginning of the making of a schedule upon which the efficiency shall be calculated. The fixing of that schedule must be the work of a person expert in the particular line in which the observation has been made and in which every consideration is given to the conditions surrounding the operation.

He also says that "men cannot be worked like machines," and this is where efficiency engineers maintain a strong position. Their object is not to increase the effort of the men, but on the other hand to decrease it, mixing a little brain with it to produce a greater output. The operator who has to run after the foreman for a job, for material, or for other things, has to work harder to turn out a satisfactory day's work. It is the object of the efficiency engineer to make the work easier for the operator. Take an actual illustration; an observer noticed that a machine was held up quite a time while two men laboriously put into place a heavy roll of paper; he studied out a plan whereby a new roll was ready to drop into the place of the preceding

one as soon as it was empty; this increased the output and diminished the effort of the employe. It is an inexcusable error to maintain that efficiency engineers study to drive men to exhaustive effort; on the contrary they aim at assisting the men to secure greater output with diminished effort.

The trouble with the present system lies almost wholly with the management and not with the men; this is why scientific management is so effective. One of the tenets of scientific management is "immediate, reliable and adequate records." These are almost wholly lacking in railway service. Managers would be astonished could they but know the true facts as to their operations, but the reports, not records, which come to them do not give them. Were such records available it would be found that the estimates made by the efficiency engineers were much too low.

Again the writer exhibits his ignorance when he says: "It is not an unusual occurrence for superintendents and foremen to be misled, by the evidence that John Brown and Tom Jones have increased their output from 70 to 100 per cent., into think that such results may be expected of all the men in their shop." If he had worked with efficiency engineers he should know that often a man of exceptional ability, the uncommon man, will attain an efficiency of 200 per cent. and keep it up day in and day out. When it is said that a concern or any part of it can be made 100 per cent. efficient, it means that the average of all the men will be that, or in other words, that the output is equal to that which would be produced if every man worked to an even 100 per cent. efficiency, a condition that will probably never occur. There will always be men of high and men of low efficiency. The fault with the present system is that high and low get the same rewards, which is neither just nor economical. The schedule always being made for the average man enables the uncommon man to realize much above the 100 per cent., and he should receive his reward in way of a bonus.

It would be interesting if the writer would name any efficiency engineer who ever contended that scientific management could be had without cost. It is one of their cardinal principles that to secure efficiency the cost of supervision must be increased and that the efficient man should receive more money. But the writer goes on to say that ultimately the men will beat the system; how this can be is past comprehension; if the operative delivers the output he gets his reward. How he is to get the reward without delivering the goods is not explained and would defy explanation.

Again, it is said that railways are different from other establishments. This is the old, old story: "That plan is excellent for so-and-so, but it would not work with me." All enterprises are alike in their fundamentals and the same underlying principles apply to all.

The writer refers to testimony taken before the Interstate Commerce Commission as to costs on some roads, but no efficiency engineer of any standing would claim that those costs were schedule costs. It might well be that roads with low costs were as inefficient as those with high costs, the low cost being the result of exceptional favoring conditions. Only an exhaustive study and trial can determine the schedule in any particular case, for any particular road or any particular establishment.

The writer ends his article with these excellent sentences: "Successful railway operation is made up of a multiplicity of steps each carefully planned and carried out; that the problem is to control the parts in order that the whole may be controlled." These sentences are the alpha and omega of scientific management, but no one with a modicum of actual experience in connection with railway operation will hold for a moment that those steps are either planned or controlled. The methods in vogue have grown up like "Topsy," without co-ordination between parts and there is constant friction between departments and divisions. Each road has its heredity, which controls its system; each head of departments has his idiosyncracies resulting from his environ-

ment and the experience of the American Railway Association is sufficient proof that this heredity and environment are the most serious obstacles to placing the railway business on a scientific basis.

The writer says: "An efficiency engineer does not hesitate to promise almost immediate results." This is rank slander of the profession; perhaps the writer can name a single instance, but it is greatly to be doubted. It is a fact, however, that in anticipation of the taking hold of an efficiency task the men brace up and make a spurt to show that they are not so black as painted, but lacking systematic management it is something that cannot be continued.

As the real work of the efficiency engineer does not begin until he comes up against the "rutty" ways of the management, it follows that no immediate permanent results can be looked for or promised, and no one knows this better than the efficiency engineer. I appeal for fair play and the discussion of this question on fair grounds, with illustrative instances instead of a wholesale denouncement with misleading and erroneous statements of fact.

F. LINCOLN HUTCHINS.

THE CREDIT FOR THE ABOLITION OF SECRET REBATES.

January 31, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In your issue of January 27 you quote ex-President Roosevelt on Paul Morton's death:

"To him, more than any one man, we owed the information that enabled the government definitely to break up the practice of giving rebates by the railways, and this service was one which he alone among the railway men was willing, at no small cost to himself, to render to the public; and for it he is entitled to the grateful remembrance of all men who deem it of prime importance to see the law justly and rightly enforced."

As you say "these statements of Mr. Roosevelt are characteristically exaggerated." They are more; they depict Mr. Morton in the role of a common informer, which certainly he never was. Railway men have gone to jail rather than take up that position.

But, further, Mr. Morton, deserving as he was, deserves no credit for bringing about the cessation of rebating.

The Interstate Commerce Commission was organized in 1887. For twelve years they made no earnest effort to abolish rebating, and the reason is plain—the commercial community, the railway traffic men, and apparently the commission itself, credited the growth of business, the stimulation of enterprise and the equilibrium of industrial conditions to the universal and ancient practice of rebating. The application of the wholesale principle and the handling of the railway as primarily a concern of its stockholders, worked out in practices analogous to and considered to be as legitimate as protective tariffs, bounties, land grants, exemptions from taxation, and other well-known forms of encouraging industry.

Into this situation entered A. J. Cassatt when he returned to the service of the Pennsylvania Railroad in 1899 as its president. With the great resources at his command, interests sufficient to give a voice in the management were purchased in the Baltimore & Ohio, the Chesapeake & Ohio and the Norfolk & Western. The co-operation of the New York Central Lines was secured. It was then announced that rebates would no longer be accorded to any shipper, no matter how important. The results were attained through peaceful methods, and were beneficial not only to the transportation companies but to the industrial and commercial interests.

To prevent the resort to secret discrimination, even during a period of commercial depression, the railways concerned in the movement were largely instrumental in formulating and urging the enactment of the Elkins laws, in 1903.

It is easy to be wise after the event, and it is not surprising that the ass appears as the claimant of the lion's skin. The plain truth is that Mr. Roosevelt's discoveries in the matter of rebates were about as novel as his discovery of the ten commandments.

F.

CUMBERLAND-CONNELLVILLE CONNECTION OF THE WESTERN MARYLAND.

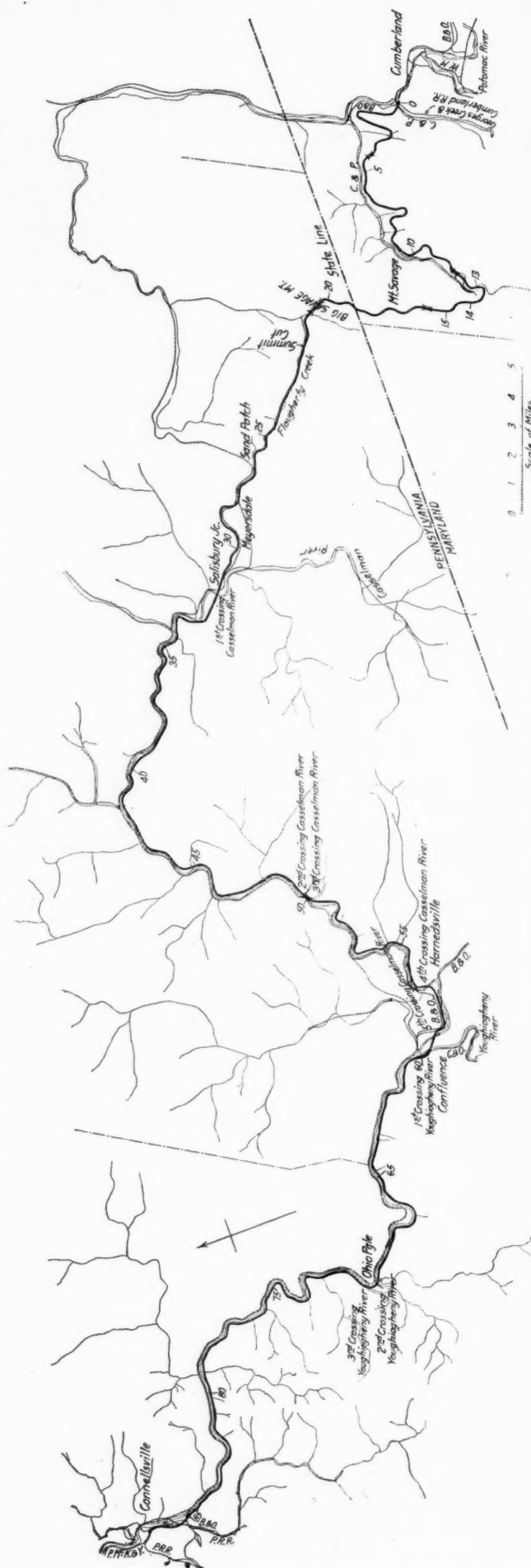
BY GEORGE L. FOWLER.

Associate Editor, *Railway Age Gazette*.

The reasons for the construction of the connecting link between Cumberland, Md., and Connellsville, Pa., for the Western Maryland having been found to be sufficient to warrant undertaking the work, it remained to solve the engineering problems presented, along the lines of modern railway construction and operation. In accordance with these, economy of operation is the matter of prime importance and, in order that the greatest possible advantages may be obtained, the cost of survey, location and construction, must necessarily rise far above what would have been considered permissible a few years ago, even through so rough a country as that in which this new line is located. The first problem, therefore, in this work was to secure a line of as low a grade as possible, especially in the matter of grades adverse to the eastbound or heavy traffic. This was to be done on what is mountain work for the whole distance. As measured on the map the air line distance from Cumberland to Connellsville is about 50 miles. Between them lie the Allegheny mountains. The general statement may be made that this range of mountains rises gradually from the West until it reaches an average summit level which is that of a large rolling tableland, and that, then, there is a rapid drop on the eastern slope which is quite abrupt and presents a rather steep face for its whole length, extending down through Pennsylvania, Maryland and Virginia. The result of this general configuration of the mountains is that, on all railway lines crossing them, the adverse eastbound grades are much lighter than the westbound. In other words, the rails ascend from the West by a long, comparatively low grade, and then, the summit being passed, drop down on the eastern slope at a rather rapid rate. This grade is comparative only, for in every case there are points where it is found to be necessary to install a pusher service. Of course the lower this grade the lower the cost of operation.

The progress in the art of railway construction has been such that locations are now adopted that would have been out of the question a few years ago. Hence, when the location of the connection of the Western Maryland was under consideration, the point that was pushed to the front was to obtain the lowest possible ruling grade against eastbound traffic over the Allegheny mountains. Up to that time the grades for the several roads that make the passage are for the Pennsylvania 79 ft. per mile; Baltimore & Ohio, 53 to 63 ft. per mile; Chesapeake & Ohio, 30 ft. per mile; Norfolk & Western, 53 ft. per mile. In the case of the Western Maryland the location adopted has maximum grades of 42 ft. per mile, compensation being made for curvature. These occur at two points and have a length of about ten miles at each place, though the pusher service will be longer, as they are flanked at each end by grades 30 ft. or more. In fact, judging from the profile it would appear that the pusher service might well extend from Harnedsville to the summit, a distance of about 35 miles. On the east slope, or against the westbound traffic the grades run from 61 ft. to 92 ft. to the mile, or from 1.15 to 1.74 per cent., and over a distance of about 22.5 miles. This grade starts one mile west of Cumberland, and is persistently heavy until the summit of the mountains is reached, and the whole crossing of the range proper is accomplished in something less than 40 miles, though the eastbound climbing starts well west of this point at Connellsville.

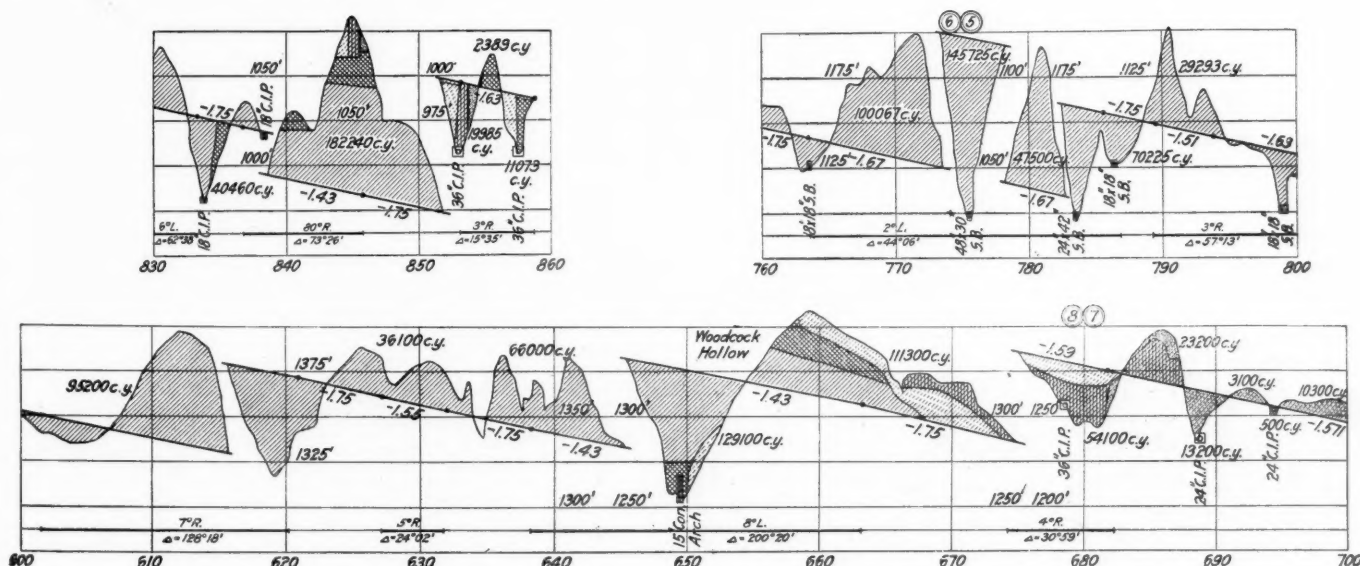
A proper appreciation of this location can only be obtained by a careful consideration of the topography of the country. The map showing the alignment will indicate at once that it was rough and cut with numerous minor ridges around or through which the road had to be carried. For example, the air line distance from Cumberland to the summit cut is 9 miles; by the selected route it is about 23.5 miles. In spite of the steep grades and the oxbows in the line, the country is not as rugged as it is on the



Cumberland-Connellsville Line; Western Maryland.

On this east slope of the mountains the rock formations are, for the most part, of sandstone and shale which have been distorted by terrestrial upheavals until the strata are frequently vertical, and as the work is followed these strata will be found at almost every possible angle. At Cumberland Narrows, where the work begins, the formation is not hard but resembles that found along the Norfolk & Western in West Virginia. It is not, however, a difficult rock to work. Towards the west the rocks become harder, especially the sandstone, until on the west slope of the mountains, there are stones of this character that are exceedingly hard, even upon the surface, where they have been exposed to the action of the water and the elements. This is especially noticeable in the tunnel work. Like most of the rocks south of the Pennsylvania or New York lines, the surface is disintegrated to varying depths and has become seamy and

The method of cut excavation is the usual one of starting the shovel in on a level of from 14 ft. to 20 ft. below the highest point in the profile, cutting out to the slope stakes, then dropping down to a correspondingly lower level and repeating the process until the grade line is reached. In the meantime the earth is drilled for shooting where it is necessary, with a light well-drilling equipment, and the material is carried to the dump in contractor's cars hauled by light locomotives. For the fills, the usual temporary trestle is used, and in a few instances this



This peculiarity of the rocks to remain hard below the surface and even on it at many points has been of great economic value in the execution of the work, since it has enabled the contractor to obtain a hard stone suitable for concrete work immediately on the ground in almost every instance. At Ohiopyle, for ex-

A few points in the profile of the line between Cumberland and the summit are selected for illustration in order to show the general character of the work. In this the hatched sections represent the work to be done. The double cross hatching and dotted lines, that completed on December 1, 1910. As usual in such cases, an effort has been made, which is usually successful, to have the cuts and fills balance within the limits of the free haul of 1,000 ft. Some of the work is exceptionally heavy as between stations 650 to 660 where there is a fill of 129,100 cu. yds., and a cut of 111,300 cu. yds. At station 585 again there is a fill of 126,200 cu. yds., while the heaviest cut on the east slope, known as the Tit cut, contains 182,240 cu. yds., and just west of it at station 775 there is a fill of 145,725 cu. yds., which has a depth over the base of its culvert of 101 ft. All along the line

there are cuts whose contents range from 30,000 to 60,000 cu. yds., and a reproduction of the profile would be merely a multiple repetition of just such work.

With a location such as that outlined, and the work being pushed with an almost feverish haste, the difficulty of operating at many points of attack from the start will be readily appreciated. Add to this the fact that, in order to meet the requirements as to speed and economy of construction, it has been necessary to use steam shovels of large capacity, the work of preparation is still further enhanced. The greater part of the work is being done by shovels weighing from 80 tons to 90 tons, and where the heavy machines of a few years ago, weighing 50 or 60 tons, are in use, they are regarded as toys and useful only in

been obstacles of great magnitude, and in spite of the difficulties that would have seemed insurmountable. Of course the distance, barring unevenness of the ground presents merely a repetition of the work required in moving the shovel up to its work in a cut or a haulback for a fresh start. The shovel moves itself, but its rails and ties must be laid for it and carried to the front for every movement. This is cited, not as a matter of special engineering significance, but as indicative of the vigor with which this work is being pushed.

In the cuts much of the material moved is of a stiff heavy clay, that shovels easily, and stands well on the slope, usually at an angle of one to one. But when dumped into the fill, it flows some, and consequently is apt to put considerable pressure upon



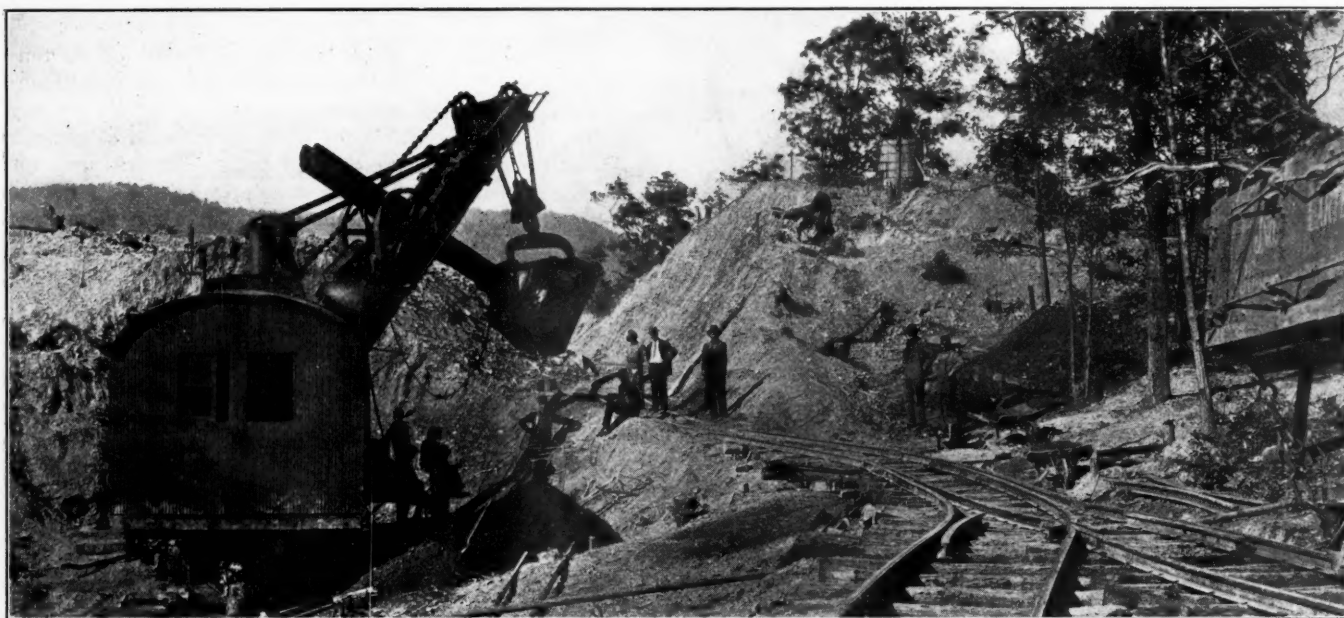
Heavy Cut Work; Western Maryland.

the smaller of the excavations and lighter materials. Take the case of the Tit cut for example. The shovel with its equipment of rails, cars and locomotives had to be hauled over the roads and through the fields from Cumberland to a distance of about 1.3 miles, and that, too, so as to reach an elevation 360 ft. above the point of departure. Or again in the case of the Allegheny summit cut. The shovel had to be carried over an ordinary country road that was not remarkably good, from Sand Patch on the Baltimore & Ohio Railroad to the summit of the mountain, a distance of about five miles and involving an actual change of elevation of about 175 ft., though, owing to the rolling character of the road the distance through which the machine was lifted was much greater. So all along the line the shovels have been brought in to the work over what must have

the lower ends of the bents of the temporary trestle. For this reason care is exercised that they are not pushed out of place by the pressure of the earth, and the material is distributed well out over the whole length of the fill, thus building the whole up at once, instead of starting in at one end and working out to the other, according to the practice prevalent in the old horse and cart days.

In making these fills it is estimated that there will be a 10 per cent. settlement, so that a corresponding allowance is made in the heights to which they are raised. This allowance is simply indicated to the contractor, as all stakes are set and marked to the true grade. But as the 10 per cent. excess is easily calculated there is no difficulty about it.

As for the height of the fills and the material used to form



Work in Tit Cut.

them, it might be expected that, in many instances it would be cheaper to put in a viaduct. It is, however, the policy to avoid viaducts wherever it is possible to do so, with the result that there is but one upon the road. This is a short distance west of Meyersdale, and will be handled in detail later. Other than this every hollow that could not be spanned with a short bridge has been filled over a concrete arch or a cast iron pipe of sufficient area to carry off the maximum flow of water that could be delivered by the contributing water shed above.

As for the amount of material to be moved; on the first division, and a little beyond, to or from Cumberland to the Mt. Savage tunnel near the summit, the total excavation is

2,500,000 cu. yds., and the estimated amount of fill practically the same, as there is no waste or borrow.

The method of tunnel driving is the same as that used elsewhere in the United States. The heading is driven along the top and the full width of the tunnel, after which the bench will be removed, a small steam shovel being worked for handling the material into the cars. Where timbering is necessary the excavation is carried down to the spring line of the arch, where the ends of the beams are footed, and from which they are carried up as shown in the diagram. These timbers are usually 12 in. square and are spaced 4 ft. between centers, though it has often happened that the pressure is so great as to spring them



Slip at Owl Hill Cut; Western Maryland.

when in this position, so that intermediate bents have had to be placed.

The drilling is, of course, done with air in the usual manner, and with the usual outside plant for compressing. Because of the speed with which this work is being done, these plants are very complete and often in duplicate, to avoid the danger of a



West Portal of Pinkerton Tunnel; Western Maryland.

shutdown. At the Big Savage tunnel for example, the boilers and compressors are housed in substantial temporary buildings. The plant consists of two compound compressors with 22¼ in. and 14¼ in. by 21 in. air cylinders, and 20 in. by 21 in. steam cylinders. They have each a capacity of compressing 1,250 cu. ft. of free air to 100 lbs. pressure per minute. There are three return tubular boilers each 6 ft. in diameter by 16 ft. long carrying a steam pressure of 100 lbs. For lighting there is a 9 in. by 8 in. vertical engine driving a 25 k. w. dynamo. This plant furnishes the light and air for both headings of the tunnel. The completed tunnel will have a length of about 3,300 ft. The air is carried over the top of the mountain to the east end of the tunnel in a 6 in. main and then into the face and the drills.

In the summit tunnel the rate of advance runs about 9 ft. a day for each heading, when everything is working well. This tunnel will be the determining factor in the completion of the connection.

As in the other tunnels the rock at this point is a sandstone, gray at the portals, but soon changing to red. At the west opening, which may be taken as typical of others as well as the east end, there were 195 ft. timbered and 120 ft. not timbered. The heading is now in the hard red sandstone above alluded to, and it is expected that this will hold to the meeting. The roof is fairly dry. Of course there is some water, but not enough to cause trouble, and as the tunnel has a crown at the center, the natural drainage will take care of all of the water that may come down. As for the formations encountered at Big Savage, the east heading first passed through a hard sandstone for 50 ft., followed by 40 ft. of fireclay. Then came 40 ft. of the fireclay conglomerate mentioned in which there was considerable sandstone, then 180 ft. of hard sandstone and slate.

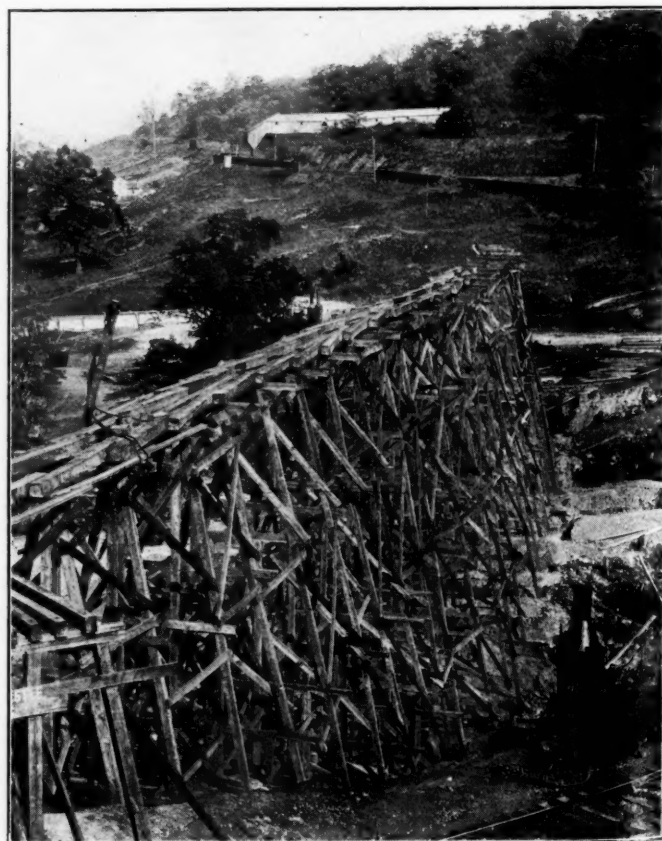
At the west end there was at first about 50 ft. of soft, friable sandstone and shale followed by 250 ft. of hard gray sandstone with occasional strata of slate; then 100 ft. of conglomerate and beyond the hard red sandstone. The general dip of the

strata is about 26 deg., with a strike nearly parallel to the line of the tunnel.

In driving the heading, which is to the full width of the tunnel the drills are brought up against the face in the usual manner, and are kept there. After blowing down, if there are any projections that extend within the limits that should be cleared, they are cared for by the use of hand drills. The drill used for this purpose is one working on the same principle as an air hammer, and is held in place by the operator. With this holes from 10 in. to 16 in. in depth can be quickly drilled and the small parts removed without necessitating the placing and bracing of a large drill.

All of the tunnels on the line are being built for a double track with the exception of the Big Savage which will be for single track. The excavation, timbering and concreting will all be done in accordance with the standard sections that are shown in the engraving. It is the intention to line all tunnels with concrete from end to end whether the roof needs timbering or other support or not. Therefore, where timbering is not required, the section of excavation will be somewhat decreased, but still will be enough larger than the finished section to allow for the concrete lining. As to how this will work out in practice is indicated by the description of the rock formation in connection with the tunnels.

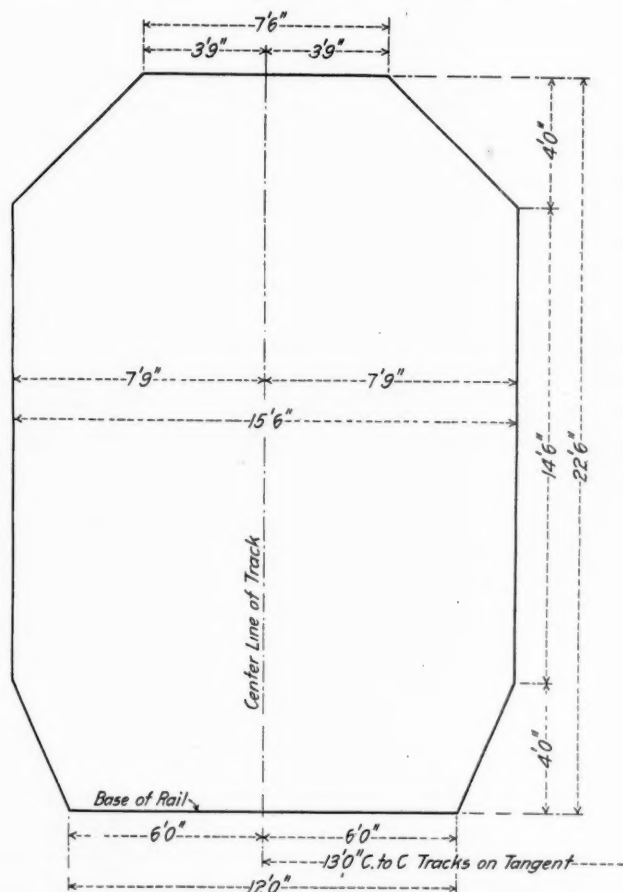
The timbering that is put in for the support of the roof during the progress of the excavation, will be the permanent timbering used, and is shown in the line engravings of the standard sections as well as in the reproductions of the photographs of the tunnel portals. It is formed of 12. by 12 in. timbers footed at the spring of the arch, in seven pieces for the double track and five for the single-track tunnels. The roof itself is carried on spalls packed in over 3 in. lagging on the outside of the



Temporary Trestle for High Fill.

timbers. Then, when the excavation is completed the timbering will be buried in the concrete. The concrete will be carried straight up to the arch segments and lagging, and, in the case of the side walls up to the plumb ports and lagging. Where

the lagging is omitted, the concrete is to extend back to the rock, unless the breakage behind the plumb posts shall exceed 3 in., in which case that space will be dry-packed. Weep holes will be left



in the concrete every 100 ft., unless conditions require a different arrangement.

Refuge niches 2 ft. 6 in. wide, with arched tops will be located every 200 ft. and staggered.

These are the requirements for the standard sections, which may be changed in detail at the discretion of the engineer. This includes such matters as the omission of the mud sills and the like. As will be seen from the engravings, the width of the

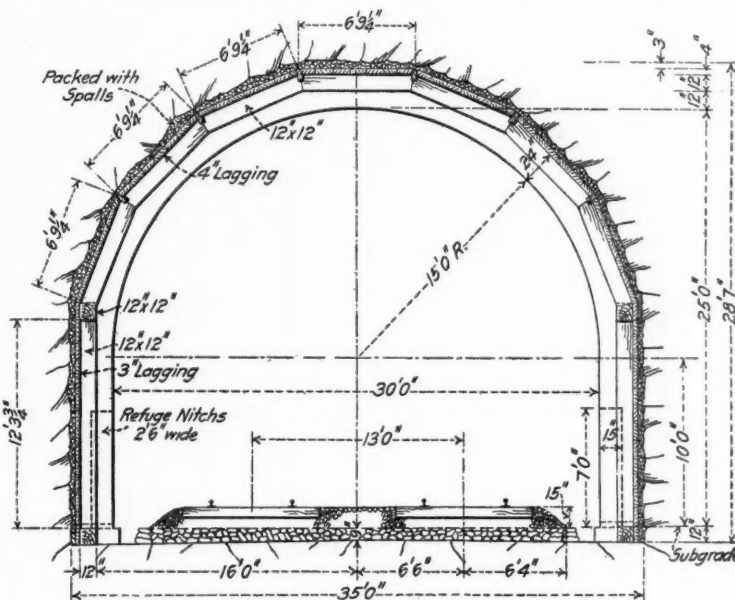
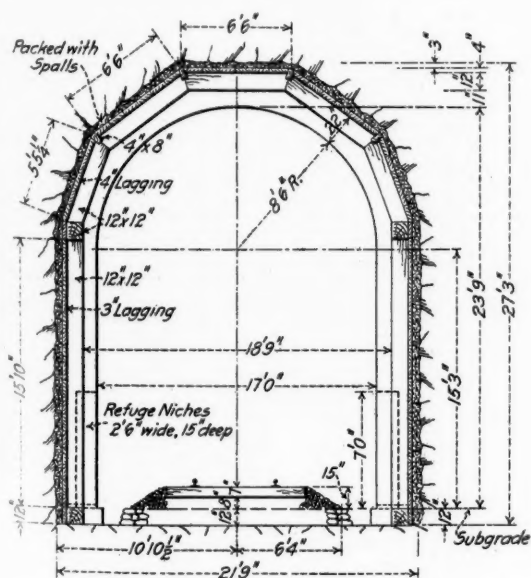
tunnels for single track is 17 ft., and for double track 30 ft., with respective heights of 22 ft. 6 in. and 23 ft. 9 in. respectively above the top of the cross tie.

Boring of the several tunnels is progressing rapidly. The Pinkerton tunnel, 825 ft. long has been completely bored through. The east and west headings were connected within the past week. The Brush tunnel, 872 ft. long has also been opened up for its entire length. The Big Savage tunnel has been bored for 1,474 ft., while in the Borden tunnel 400 ft. of the 850 ft. have already been excavated. Work is being prosecuted in night and day shifts. Track laying is expected to commence by the first of April.

After passing the Big Savage tunnel, the line continues to rise to the Allegheny cut about 23.5 miles from Cumberland. It then starts down on a grade of 34 ft. to the mile, increasing at times to 42 ft. to the mile as a maximum, and dropping as low as 16 ft. until Harnedsville is reached. During the early part of the descent, the line passes over a rolling country and follows a small stream (Flaugherty Creek) nearly to Meyersdale, just below which place it reaches the banks of the Casselman river. From this point on it is close to the banks of that stream or of the Youghiogheny, into which it empties down to Connellsville.

Shortly after leaving Meyersdale the topography changes; the valley narrows, the hills on either side become steep and rocky, and the stream flows through a narrow gully with almost precipitous sides. This does not necessarily involve heavy work of construction, but it is very rough and a great deal of it is rock work. The country has the same rough contour as most of the rest of the valley or hollow land along the streams on the western slope of the Alleghenies. The location is on side hill for nearly the whole distance from Confluence to Connellsville and all of the distance from Ohiopyle down. In one or two cases where bluffs rise directly from the bed of the stream they will have to be blown away, and a shelf built for the reception of the road. This is simple, straight work, and is the same as that of the Baltimore & Ohio along the opposite bank of the stream, or of the Lehigh Valley or Central of New Jersey down the Lehigh river. So that, when the roughness of the country is considered, the skill with which the line was located is shown by the almost perfect smoothness of the profile as it rises on either side from Cumberland and Connellsville to the summit of the Alleghenies.

Although the general character of the work is the same along the river, each short section is apt to present problems and sometimes serious problems of its own. For example, at Owls Hill, a short distance east of Confluence, the line was originally laid



Single and Double-Track Tunnels; Western Maryland.

out to skirt the foot of a high wooded bluff. From examinations that had been made it appeared to be a case of comparatively easy shovel work. But after the work had been started and the toe of the slope cut away, the whole side of the mountain started to slip. It was, then, found that the underlying rock had a steep slope and that the earth had nothing to hold it. The first indication of a slip came at night and it was only by prompt effort that the contractor saved his shovel from being buried. Then, for several days, the shovel was pulled back out of the way each night, until it became evident that to build the road on the original location it would be necessary to remove the whole mountain, when the alignment was thrown out and away from the toe of the bluff and room left for any slip that may occur. It will be seen, from the engraving, how the rock is stripped and the earth has come down.

A subsequent article will take up the bridges and culverts.

THE SUPPLY DEPARTMENT.

BY H. C. PEARCE.

General Storekeeper, Southern Pacific Company.

VI.

BUYING UNDER CONTRACTS OR AGREEMENTS.

The plan of purchasing under contracts or agreements directly from manufacturers for the purpose of maintaining standards and obtaining uniform material and uniform deliveries is one which was developed by W. V. S. Thorne, director of purchases for the Harriman Lines, and is most ably and thoroughly outlined in detail in a paper read by him before the New York Railroad Club, May, 1908. This paper should be studied carefully by every executive officer, as well as officers of the supply department. Its principles are based on the necessity of establishing and maintaining standards, and buying what is most suitable for the purpose desired at the lowest cost, fully protected by complete specifications and thorough inspection.

The first is brought about by regular meetings of experts who use the material, and who should know the exact purpose which it serves and what is best adapted for that purpose. For example, in the matter of equipment, locomotives, cars, etc., the expert representatives of this department meet at stated periods. If it be on maintenance of way matters, the chief engineers or engineers of maintenance of way are called together in the same manner.

Certain specific equipments will be submitted at this meeting, freely discussed, and finally a vote taken as to adoption for use of some one of them. Detailed specifications and drawings will then be prepared of the article adopted, and it will bear the same number as the drawing, and is designated common standard. Any future changes in designs and specifications will be covered by supplement or revised drawings and will always carry the same number.

In this way the drawings and specifications are placed in the hands of the different manufacturers, and the most satisfactory as regards price, deliveries, etc., is accepted, and an agreement made for the necessary supply. The manufacturer is thus able to figure accurately just what it will cost to produce this particular article; his market is assured and he can arrange his facilities and plant so as to produce it at the lowest possible cost. The railway company on the other hand is assured of getting exactly what it buys, and it can be arranged so that they will get uniform and specific deliveries.

These contracts and agreements are usually based on the market price of raw material, and are subject to change within a reasonable length of time, which is indicated in the agreement, so it is perfectly fair for both parties. This agreement, in addition to specifying the price at which the article shall be delivered at a given point, should also specify the number of days

that they agree to make shipment from the date of the order, with a penalty clause for failure to do so. Under this arrangement the purchasing agent is in position to place the order the day he receives it, the descriptions, drawing references, price and deliveries already having been arranged for. The manufacturer has the drawings, schedules and full detailed knowledge of what is required, and the day the order is received he is in position to either make shipment or prepare the material for this purpose.

The material is inspected on the ground by this company's inspector to see that it conforms to the specifications and drawings, a certified copy of such acceptance is attached to the purchase bill covering the shipment, which goes directly to the purchasing agent, who is thus in position to check the prices and deliveries according to the terms of the agreement.

No more fair, simple and thorough system could be evolved, and it carries with it uniformity promptness and the lowest possible cost to the railway company.

HOW TO INSTALL PLAN WITHOUT DISORGANIZATION.

This plan can be installed under any system without inconvenience or expense. First, make a rough sketch of your facilities, your storehouse, platforms, material yards and other storage, and lay it off into sections. Have in mind grouping it for economical handling, irrespective of where the material is located at the present time. Indicate on this sketch the section number, general description of the material it will contain and the location of the section storekeepers' headquarters. Have signs put up over these sections with the section number. Build a small station for the section storekeeper, large enough to contain his stock books, requisitions, catalogues and other data. Prepare a card which will show the sectional arrangement of the material, somewhat like the accompanying list. Tack this up at section headquarters, inside and out. Prepare an indexed list of the material to be carried in each section, arranged alphabetically, which will show the section where it is located. Distribute these lists and cards to each division and local storekeeper, superintendent, division engineer and all other officers who have authority to make requisitions for material and instruct them to make their requisitions from a certain date by sections, a separate requisition for each section.

SECTIONAL ARRANGEMENT OF MATERIAL IN STOREHOUSES.

Section.	Description of Material.
1.	Maintenance of way material, steam shovel parts, hand car, motor car and velocipede parts.
2.	Bolts, nuts, rivets, lag screws, washers, etc.
3.	Sheet iron, brass, copper, zinc, lead, engine bars, springs, tubing, chain, wire rope, jack screws.
4.	Boiler and fire-box steel, steel tank ends, flues, pipe, bar iron, bar steel, piston rods.
5.	Boiler lagging, pipe covering, nails, carbide, shovels, rope, building paper, wire staples, handles, etc.
6.	Finished and rough brass, pig metals, etc. (except journal bearings).
7.	Air brakes, lubricators, injectors, automatic sanders, steam heat equipment, Pintsch and acetylene gas material, electric headlight parts.
8.	Car trimmings and fixtures, shelf and building hardware, small tools, metal piston and valve stem packing.
9.	Water service material, pipe fittings, globe, angle and gate valves, etc.
10.	Upholstering material, etc.
11.	Glass, brushes, painters' supplies, paints in packages.
12.	Belting, hose, packing, rubber and leather goods.
13.	Station and train supplies, lamps, lanterns, chairs, glassware, tinware, etc.
14.	Castings (rough iron and steel), except car castings.
15.	Car castings and forgings, journal bearings, bolsters, brake beams, car trucks, car bolts, couplers and parts, train chains, stoves and parts.
16.	Wheels and axles (mounted and unmounted), tires, centers, front ends, cylinders, etc.
17.	Lumber, all kinds (rough and finished).
18.	Fire clay, brick, cement, coke, charcoal, smithing and Blossburg coal.
19.	Oils, waste, grease, varnishes, candles, etc.
20.	Signal, telegraph, telephone, interlocking and electrical material.
21.	Scrap, all kinds.

Then go through your organization and select from your warehousemen and stock clerks, a man for each section. You always have men in every organization who are particularly familiar with certain classes of material. For example, one man will be familiar with track material, he should be assigned to this section, another with locomotive castings, another with car castings and forgings, another with hardware, etc., and still another who looks after air brake material, lubricators, injectors, etc., aiming always to have a man assigned to the section with which

he is most familiar. His instructions will be to take entire charge of this section of material, *no matter where it is located*. He will then naturally concentrate his material into his section and arrange it so it will be most convenient for him to handle it. Only in this way can he control it, and be entirely responsible for it. This can be done gradually as the plan develops and will in no way interfere with the regular operations. It will be found that the men themselves will be more anxious than anyone else to get the material they are in charge of and responsible for directly under their own supervision.

Naturally the requisitions will be made from the stock books, in sections, and the orders on the purchasing agent and the purchase bills will follow in sequence. In fact the whole plan will develop out of this arrangement. The purpose of signs is to identify the grouping of the material with certain numbers. It will only be a short time when if you ask where a certain man is, they will answer by giving the section number. The next step will be to install the telephone system, a telephone in each section. This enables the officers and foremen to get in instant communication with each section storekeeper, and from this the shop delivery system will develop, as described in another chapter.

The same arrangement will apply to scrap docks, lumber yards, oil houses and other outside points where supplies are handled. After the plan is installed the general store the division stores will follow as a matter of course. With the sectional organization once installed, details can be worked out to as fine a point as desired and to suit any general plan, and it can be done without disorganization or extra expense.

WEAKNESS AND STRENGTH.

The weaknesses of the present supply department are: first, the officer who is usually held responsible for providing material and the money invested in it really has no control over the buying of it. Strange as it may seem, the general plan is to have him subordinate to the purchasing agent. On what theory this is based the writer is unable to conceive. It is certain that the man who is responsible for the money invested in material must also be responsible for the buying. In no other way can the desired results be obtained, and it is surprising to the writer that, with the great advances that have been made in the last few years in railway economics, this point has been lost sight of, and that the real purpose of the organization, i.e., furnishing only what is wanted when it is wanted with the lowest permanent investment, can never be obtained until the buyer is under the direction of the officer who is responsible for the investment. On properties where the amount of material used does not warrant an organization of this kind there should be a supply agent who would be responsible for both the buying and distribution. On larger systems, however, unquestionably the proper organization is an officer in charge of both purchases and distribution, with a sub-head to do the buying and another to maintain the stock and have charge of the distribution.

The second trouble is lack of proper organization and system; and a man with the necessary rank and detailed knowledge and training to effect it and carry it on. One of the first and most important facts to take into consideration is the danger of more material being provided than is necessary, and lack of proper interest in seeing to it that everything possible is made available. This should be one of the first and most important duties of the chief supply officer, and it is necessary that he should have such rank as will enable him to get the full benefits of his organization. Without a proper organization, manned by competent help, nothing of any great value can be maintained. The strength of an organization depends very largely upon its head and its personnel, and the men in it must have the same rank, opportunities and remuneration as those in other departments. It is not technical knowledge that is needed, but good business training and industry. Our organizations have been severely handicapped, and will be for some years, for lack of trained help. It has been recruited largely from men transferred from other

work, principally in and around the shops. Younger men coming up, as soon as they could get something better to do, got transferred, with the result that there is today a smaller percentage of trained men capable of handling supplies than in any other department on a railway. But they are increasing rapidly, and it is only a matter of a few years when there will be plenty of trained men to take up the work. There has never been any systematic method of apprenticeship and promotion. There is no question but that this can be done, and will furnish great strength to the organization.

Another weak point in most organizations is the failure to grasp the importance of prompt action and its relation to stock and stock investment. Their efforts have been devoted more to obstructing than taking action. Their idea was that by delay and obstruction some other arrangement would be made, and the material would not be needed at all. For that reason departments that had work to do did not have confidence in getting what they wanted, and consequently laid in large stocks and made provision, simply because they knew by experience they never could get anything when they wanted it. This led to enormous losses in the way of material deteriorating and becoming obsolete.

The first essential towards a competent organization is the prompt handling of requisitions. Until stocks are in such shape that requirements may be filled, and the organization is in such shape as to promptly do so, they are impotent, and serve no good purpose. Lack of facilities hampers operations very considerably, but with a proper organization this can be largely overcome. The advantage of facilities is chiefly for proper protection of material from the weather and to reduce the cost of handling.

The accounting in our stores has generally been well presented, in fact it has received first consideration. In many organizations more money has been expended in keeping the accounts than in caring for, handling and distributing the material. Yet in many cases the accounts are worthless, because they are on an unsound foundation. Inventories have been taken in offices without any knowledge of the material, what it was, or the condition it was in. While reports and records neatly kept may look well written up on a typewriter, they may be found to be absolutely worthless, and unless they are based on actual inventories and have been compiled by practical men on the ground, they are not worth the paper they are written on.

The delivery of material is another source of weakness. It is the usual practice to send it in local freight, and we all know what it is to move company material in this city. The supply cars solve the problem so far as ordinary maintenance and operation are concerned. That is, where each division has a set of cars it covers a great many local deliveries, but still we have a great volume of material that will always move on local freights in the regular way, and this will always have to be watched and delays carefully guarded against.

The strength of the organization consists:

First—In the fact that there is a strong, growing demand for it, made necessary by concentration and system, the enormous amount of actual money that is required to furnish materials for large railways or industrial corporations, and the fact that executives recognize that this work can only be properly and economically done by men whose every-day work it is; and as they commence to realize what an organization of this kind can do towards reducing expenditures for material and supplies, maintaining standards, facilitating the work, as well as protecting the company against extravagance and loss, the importance of the department will be greatly enhanced. Our owners and executives are bound to appreciate sooner or later that a supply department should be for the purpose of decreasing its purchases and not increasing them.

Second—It is being equipped with strong young men who are ambitious and workers; men who have learned the value of close application to detail, and who have become accustomed

to devoting their entire efforts to the work at hand. These men will all develop and always carry with them a complete and well founded knowledge of details and facts as they exist in practice.

Third—The training they have received in the past, and the reorganization that is going on at present, is all along the line of greater economy and efficiency. This will lead not only to better results for their employers, but it offers employees a training and molds their character in a manner which will last through their entire lives.

MALLET LOCOMOTIVE WITH ARTICULATED BOILER REBUILT FROM OLD POWER.

BY M. H. HAIG.

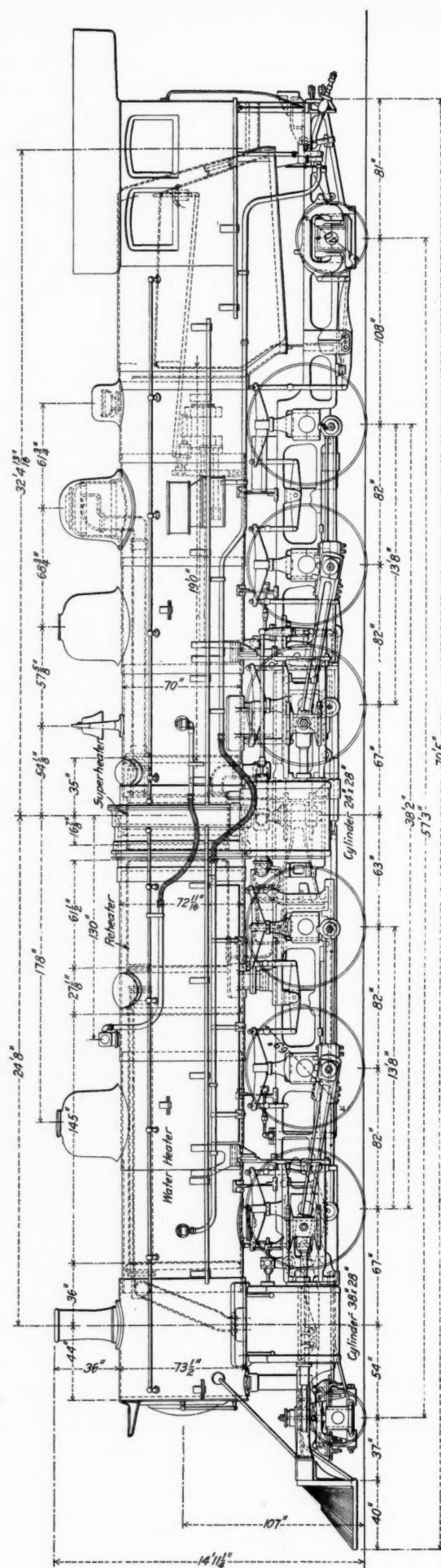
Mechanical Engineer, Atchison, Topeka & Santa Fe.

The demand for larger power units, due to traffic conditions, raises a question as to the disposition of the older and smaller locomotives. New locomotives are often introduced in large numbers, leaving the older and smaller ones for use on branch lines, or to be scrapped or sold. The Mallet principle of locomotive design not only provides a power unit of large capacity easily controlled by the usual crew, but is further peculiarly adapted to the disposition of the old power. By combining two locomotives, each of which were formerly mounted on a single set of drivers into one Mallet locomotive mounted on two sets of drivers, or by adding a new front section to an existing locomotive, the old power is absorbed and larger power is provided without causing a surplus of old power to be disposed of at a loss. This principle possesses still further merit in that the larger power thus obtained is served by existing standard repair parts.

The Atchison, Topeka and Santa Fe has recently converted two Prairie type freight locomotives into a single Mallet locomotive. It was designed in the office of the mechanical engineer and was built in the company's shops at Topeka, Kan., Experience in its construction and careful investigation into the assignment of power affected by the introduction of Mallet locomotives have demonstrated that the conversion of the old locomotives is more satisfactory and more economical than combining two existing locomotives into a single Mallet. Combining two locomotives depletes the total of locomotives in service, whereas, the addition of a front section increases the capacity of each locomotive converted without affecting the number and the older power is well disposed of. The cost of a new front section is considerably less than that of a complete locomotive. Therefore, adding a front section to an existing locomotive is more economical than combining two existing locomotives. As a result of this experience 14 locomotives are being converted to the Mallet type by the addition of front sections, the work of conversion being done at the company's shops.

The experimental Mallet locomotive rebuilt from two existing locomotives is in service and possesses several features of interest. The locomotives selected for rebuilding were two made by the Baldwin Locomotive Works, equipped with Vauclain compound cylinders, and needing new cylinders and general repairs. In the construction of the Mallet locomotive the old frames, wheels, boxes, valve motion, machinery, etc., were used. The old firebox and boiler were mounted on the rear section of the locomotive and new cylinders 24 in. and 38 in. in diameter, respectively, were mounted on the rear and forward sections.

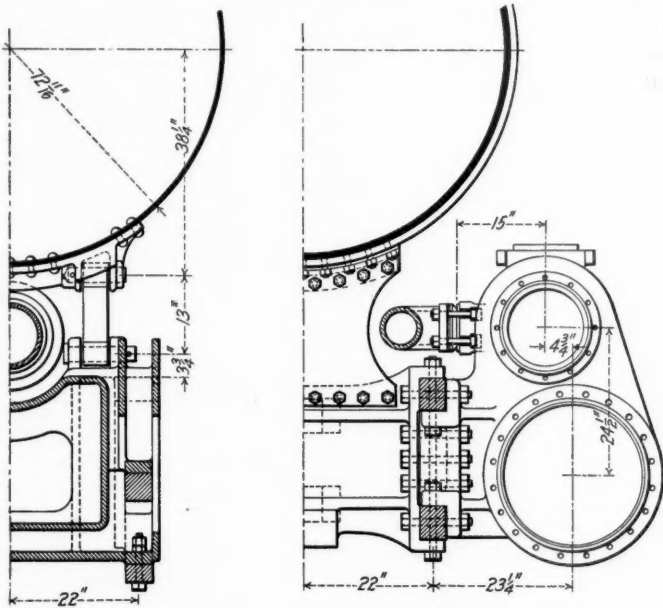
The greater steam capacity to meet the requirements of the single larger locomotive was provided by the addition of a feed water heater, a superheater for the high pressure cylinders, and a re-heater for the low pressure cylinders. The superheater and re-heater are of the Jacobs type and include two drums containing a number of fire tubes. The hot gases pass through the tubes and the steam passes through the drums around the tubes, being directed over the surfaces of the tubes in thin streams by baffle plates properly arranged. The superheater is in the



Mallet Locomotive with Articulated Boiler, Rebuilt from Old Power; Atchison, Topeka & Santa Fe.

rear section of the boiler in the part constituting the smoke-box of the old boiler. The re-heater is in the forward boiler section, just back of the feed water heater. Between the super-heater and the front flue sheet of the boiler is a working space 23 in. long for working on the flue ends. Access to this space

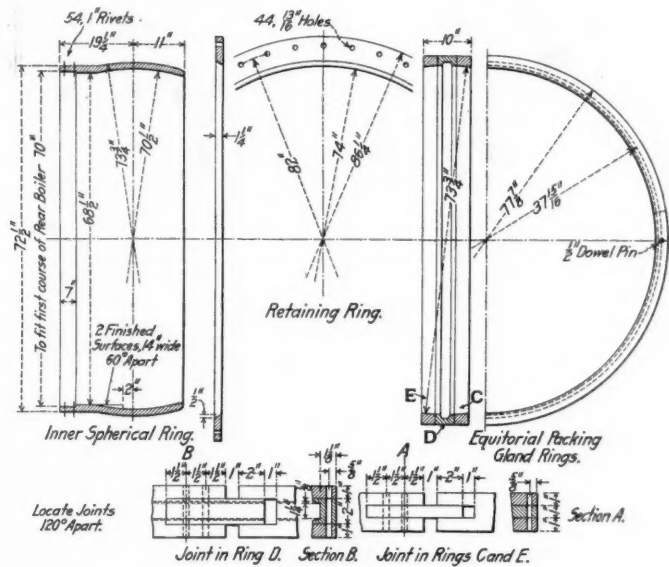
28½ in. long by 60 in. in diameter. It contains 324 flues 2¼ in. in diameter, the flues and drum providing a heating surface of 484.6 sq. ft. The re-heater is 61⅞ in. long by 60 in. in diameter and contains 336 flues, 2¼ in. in diameter, providing a total heating surface of 1,063 sq. ft. The ends of the flues in both the superheater and the re-heater are welded by the autogenous



Partial Sections on either side of the Pivot Connection.

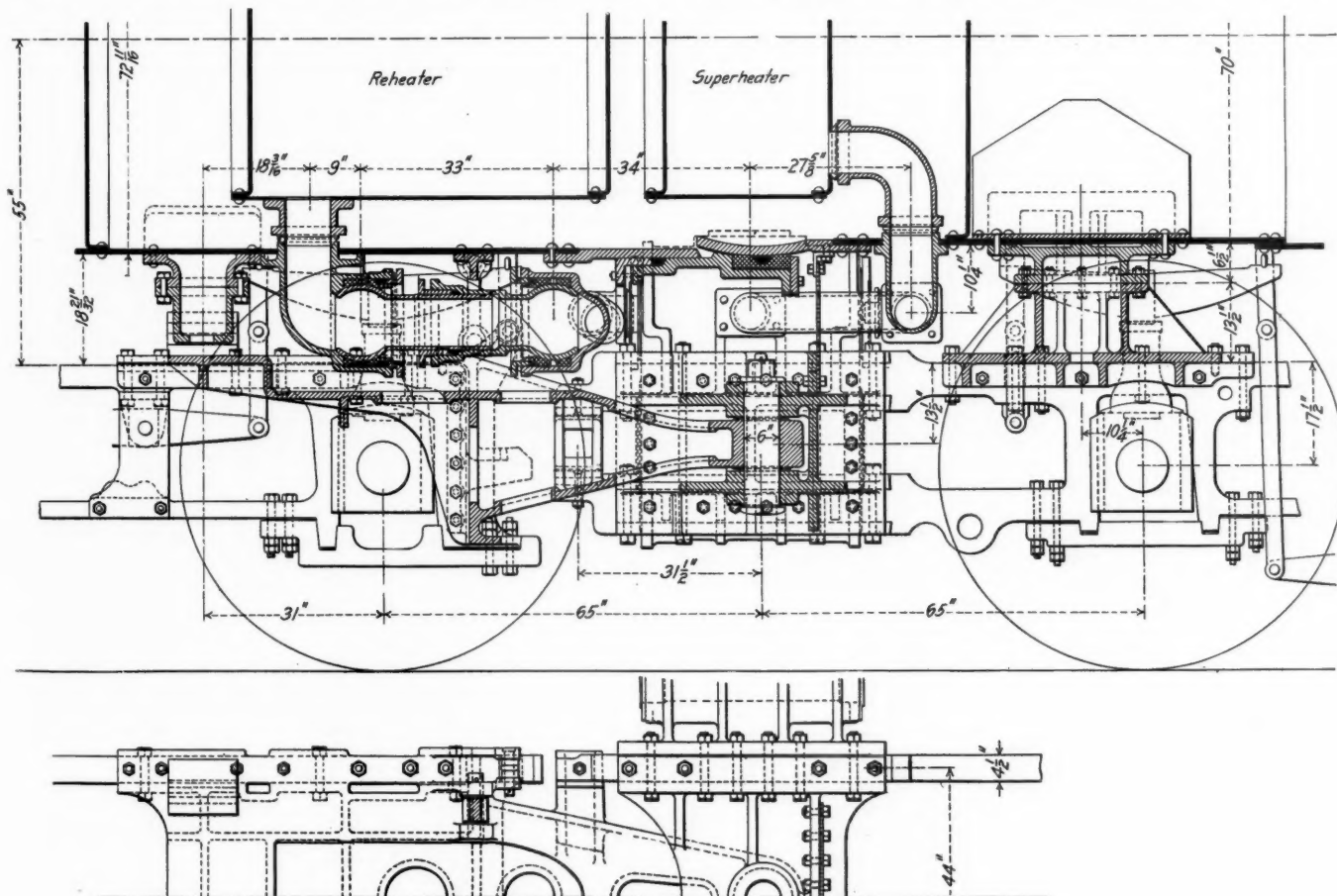
is provided by a manhole in the boiler sheet. A similar working space 27½ in. long is arranged between the re-heater and the back flue sheet of the feed water heater.

The superheaters were described on page 814 of the *Railway Age Gazette* for October 29, 1909. The superheater drum is



Details of Flexible Boiler Joint.

process. The feed water heater is of the usual form applied to a number of Mallet locomotives. It contains 303 flues $2\frac{1}{4}$ in. in diameter and 12 ft. 1 in. long, providing a heating surface of 2,216.54 sq. ft. The total heating surface of the firebox, boiler flues, superheater, re-heater and feed water heater is 7,507 sq. ft.



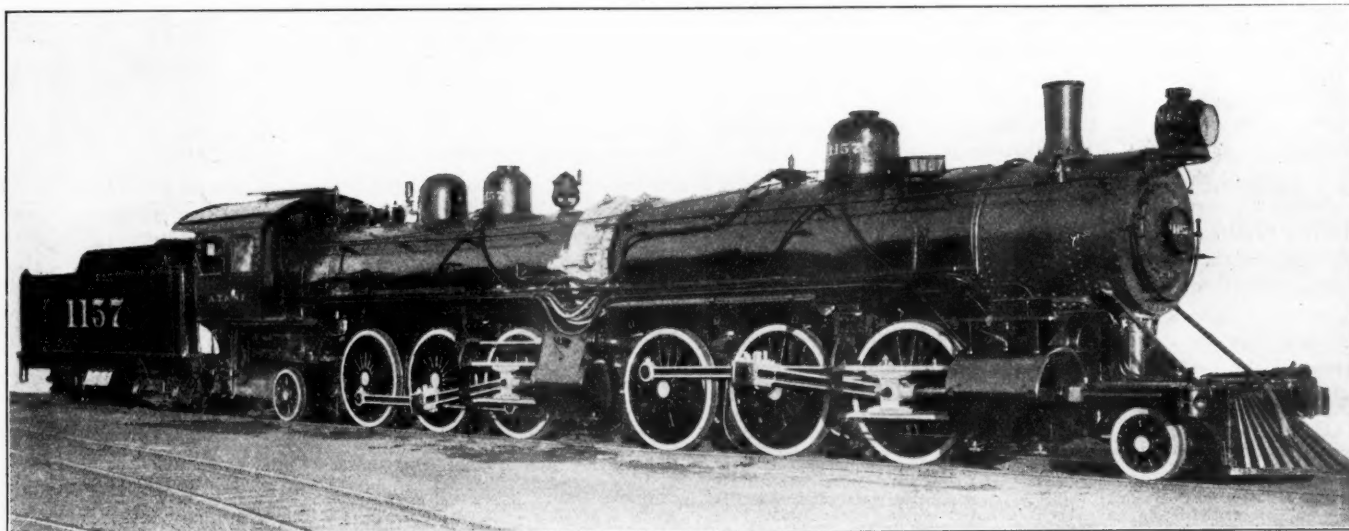
Pivot Connection for Mallet Locomotive.

and back sections of the boiler, respectively. The casing C is fitted over the sleeve of the rear boiler section but is not secured rigidly, being packed by the gland E which is adjusted by means of studs. The casing slides over the spherical ring, being packed by the rings D, which are held in place by retaining ring F. The retaining ring is bolted to the casing. Details of the packing gland rings are also shown in one of the drawings. They are turned to fit the radius of the spherical ring and are joined in such a manner as to allow flexibility when rounding curves.

To insure the joint returning to its proper position when the locomotive enters a tangent after rounding a curve, the two sections are tied together on the horizontal center line of the boiler by two rods, each working in connection with two coil springs which provide the necessary flexibility. They are 4 in. outside diameter and of $\frac{1}{2}$ in. material. The details of the rods, springs, spring pockets, etc., are shown. The spring pockets G and H are bolted at opposite sides of the joint. Disconnecting the joint is easily accomplished when it is necessary to uncouple the two sections of the locomotive. All connections binding the boiler shells of the two sections are released by removing the rods I and by loosening the packing rings around the joint.

The Ragonnet reversing gear is used for controlling the valve motion. The general dimensions of the Mallet locomotive, to-

Cylinders.			
Kind	Vauclain Comp.	Compound	
Diameter	17 in. and 28 in.	24 in. and 38 in.	
Stroke.....	28 in.	28 in.	
Valves.			
Kind	Piston		
Diameter	15 in.	Bal. piston	
		H. P., 13 in.	
		L. P., 16 in.	
Wheels.			
Driving, diameter over tire.....	69 in.	69 in.	
Driving, thickness of tire.....	$3\frac{1}{2}$ in.	$3\frac{1}{2}$ in.	
Driving, journals, main, diameter....	10 in. x 12 in.	10 in. x 12 in.	
Driving, journals, others, diameter....	9 in. x 12 in.	9 in. x 12 in.	
Engine truck, diameter	$31\frac{1}{4}$ in.	$31\frac{1}{4}$ in.	
Engine truck, journals.....	$6\frac{1}{2}$ in. x 12 in.	$6\frac{1}{2}$ in. x 12 in.	
Trailing truck, diameter.....	40 in.	40 in.	
Trailing truck, journals.....	8 in. x 14 in.	8 in. x 14 in.	
Boiler.			
Style	Straight	Straight	
Working pressure	220 lbs.	220 lbs.	
Outside diameter of first ring.....	70 in.	70 in.	
Firebox, width and length.....	97 in. x 117 $\frac{3}{4}$ in.	97 in. x 117 $\frac{3}{4}$ in.	
Firebox plates, thickness.....	$\frac{3}{8}$ in. and $\frac{9}{16}$ in.	$\frac{3}{8}$ in. and $\frac{9}{16}$ in.	
Firebox, water space.....	$4\frac{1}{2}$ in. and 4 in.	$4\frac{1}{2}$ in. and 4 in.	
Tubes, number and diameter.....	318—2 $\frac{1}{4}$ in.	318—2 $\frac{1}{4}$ in.	
Tubes, length	18 ft. 11 in.	18 ft. 11 in.	
Heating surface, tubes.....	3,546 sq. ft.	3,546 sq. ft.	
Heating surface, firebox.....	195 sq. ft.	195 sq. ft.	
Heating surface, total.....	3,741 sq. ft.	7,507 sq. ft.	
Heating surface, feed water heater....	.....	2,216 sq. ft.	
Grate area	54 sq. ft.	54 sq. ft.	
Tender.			
Wheels, diameter	$34\frac{1}{4}$ in.	$34\frac{1}{4}$ in.	
Journals	$5\frac{1}{2}$ in. x 10 in.	$5\frac{1}{2}$ in. x 10 in.	
Water capacity	6,000 gals.	9,000 gals.	
Coal capacity	10 tons	12 tons	



Mallet Locomotive with Articulated Boiler, Rebuilt from Old Power; Atchison, Topeka & Santa Fe.

gether with the principal dimensions of the two locomotives converted, are given in the accompanying table. The tractive effort of a single Prairie type locomotive of the class from which the two were selected for conversion is 34,700 lbs. The tractive effort of the Mallet locomotive estimated by the usual formula is 68,000 lbs.

General Data.

Type	Prairie Freight	Mallet Freight
Service	Bit. coal	Bit. coal
Fuel	34,700 lbs.	68,000 lbs.
Tractive effort	210,190 lbs.	358,250 lbs.
Weight in working order.....	141,690 lbs.	290,000 lbs.
Weight on drivers.....	322,800 lbs.	527,950 lbs.
Weight of engine and tender in working order	13 ft. 8 in.	13 ft. 8 in.
Wheel base, rigid.....	32 ft. 2 in.	57 ft. 3 in.
Wheel base, total.....	57 ft. 8 $\frac{3}{4}$ in.	90 ft. 1 in.
Wheel base, engine and tender.....		

Ratios.

Total weight ÷ tractive effort.....	6.0	5.2
Weight on drivers ÷ tractive effort...	4.08	4.26
Tractive effort × diameter drivers ÷ heating surface	643	625
Total heating surface ÷ grate area...	69.44	139.00
Firebox heating surface ÷ total heating surface, per cent.....	5.21	2.6
Weight on drivers ÷ total heating surf.	37.9	38.63
Total weight ÷ total heating surface..	56.00	47.70
Vol. equivalent simple cylinders, cu. ft.	11.48	20.60
Total heating surface ÷ vol. cylinders.	325.6	369.2
Grate area ÷ vol. cylinders.....	4.7	2.6

The Santa Fe recently purchased a number of locomotives of the same general dimensions and capacity as the Mallet locomotive converted in its own shops. All of these are equipped with Jacobs-Shupert fireboxes and with the exception of two, with rigid boilers. Of the two flexible boilers, one is articulated by a double ball joint applied by the Baldwin Locomotive Works and somewhat similar in design to the Leighty joint described; the other is provided with the Vauclain bellows type joint. All of these locomotives are in service in the Pan Handle district of Texas. The locomotives with articulated boilers have been placed in service among the others without special care or supervision. After they have been in service a sufficient length of time to justify a conclusion as to the merits of the several boiler arrangements, sufficient data should be available by which to determine the most desirable boiler for future Mallet locomotives.

On December 4, 1910, the railway from Ligua, Chile, to Papudo north of Valparaiso was opened to traffic. The road is 17 miles long, with a gage of 39.37 inches, and connects the port of Papudo with the Longitudinal Railway at Ligua. The cost of construction was \$23,553 per mile.

ACCIDENT BULLETIN NO. 37.

The Interstate Commerce Commission has issued Accident Bulletin No. 37, containing the record of railway accidents in the United States during the three months ending September 30, 1910. The number of persons killed in train accidents was 321, and of injured 3,892. Accidents of other kinds, including those sustained by employees while at work, by passengers in getting on or off cars, by travelers at highway crossings, by persons doing business at stations, etc., by trespassers, and others, bring up the total number of casualties, excluding "industrial accidents," to 22,238 (2,948 killed and 19,380 injured). The casualties are classified in Table No. 1, given below, which includes some details taken from Table 1b, not here shown¹. Supplementing the statement of railway accidents proper, the commission gives the following record of—

Industrial accidents to employees.		Killed.	Injured.
While working on tracks or bridges.....		40	5,545
At stations, freight houses, engine houses, coaling stations, water stations, etc., where no moving railway car or engine is involved.....	21	4,654	
In and around shops.....	15	9,028	
On boats and wharves.....	35	283	
At other places.....	21	1,492	
Total.....	132	21,002	

NOTE.—Accidents occurring in connection with railway operation or distinctively railway work are shown in the double-column table. "Industrial" accidents are those occurring to employees of the railway on railway premises in which movements of cars or engines are not involved.

Adding the casualties to employees in industrial accidents to the figures given in the larger table, the total number of employees killed, including those not on duty, is 1,080, and injured, 33,642; and this makes the total number of persons killed, all classes, 3,080, and injured, 40,382.

The totals of the items in Table 1 are swelled by the inclusion of classes of casualties not heretofore shown in the quarterly bulletins, as already explained, but the lists of casualties are also very large in those items which are made up on the same basis as under the former law, as will be seen by reference to Table 1A, below. In the first, third, and fourth items of that table the increases over the corresponding quarter of 1909 are very large. Except in the first item, it is possible that the increases are in part due to the adoption of more careful methods of keeping

¹ This bulletin is the first one issued under the revised accident law. In previous quarterly bulletins the records have included only collisions, derailments, casualties to passengers, and casualties to employees on duty. The class termed "Industrial accidents," as found in the present bulletin, includes a large part of those injuries to employees, fatal and nonfatal, which in former bulletins have been included under "other causes," in Table No. 1. This item in the present and future tables, therefore, will not be comparable with the same item in bulletins 1 to 36, inclusive.

records by the railways, consequent on the change in the law, though there is no conclusive evidence of this. In Table 2A, giving causes in detail, the record of passengers killed in train accidents (63 in Table 1) is further swelled by the inclusion of 2 disastrous collisions on electric railways in which 40 persons were killed. Table 2A contains 8 collisions, in which 95 persons were killed, and 125 were injured, and 1 derailment in which 14 were killed and 22 injured. In the corresponding quarter of the preceding year the five most serious accidents caused 47 deaths.

TABLE NO. 1A.—Comparison of principal items with last bulletin and with one year back.

	Bulletin 37.	Bulletin 36.	Bulletin 33.
1. Passengers killed in train accidents.....	63	12	56
2. Passengers killed, all causes.....	135	55	104
3. Employees (on duty) killed in train accidents.....	209	125	137
4. Employees (on duty) killed in coupling.....	56	45	38
5. Employees (on duty) killed, all causes.....	869	711	748
6. Total, passengers and employees (items 2 and 5, above).....	1,004	766	852
7. Other persons killed (including trespassers, nontrespassers, and employees not on duty), all causes.....	1,944	...	...
8. Employees killed in industrial accidents.....	132	...	...

TABLE NO. 2.—Collisions and derailments.

	Number.	Loss.	Killed.	Injured.
Collisions, rear.....	301	\$342,368	27	413
Collisions, butting.....	184	424,846	85	831
Collisions, train separating.....	97	33,833	5	46
Collisions, miscellaneous.....	805	401,600	39	669
Total.....	1,387	\$1,202,647	156	1,959
Derailments due to defects of roadway, etc.	290	\$173,875	10	276
Derailments due to defect of equipment.....	796	713,309	30	242
Derailments due to negligence of trainmen, signalmen, etc.....	112	134,365	16	193
Derailments due to unforeseen obstruction of track, etc.....	93	161,287	49	210
Derailments due to malicious obstruction of track, etc.....	35	36,526	5	51
Derailments due to miscellaneous causes.....	417	449,492	37	421
Total.....	1,743	\$1,668,854	147	1,393
Total collisions and derailments.....	3,130	\$2,871,501	303	3,352
Total for same quarter of 1909.....	2,751	2,316,014	180	3,341
1908.....	2,567	1,950,408	176	2,729
1907.....	4,279	3,605,696	309	4,534

In the larger double column table will be found the usual list of class A train accidents—all in which the damage is reported at \$10,000 or over, notable cases in which passengers are killed, and those doing damage less than \$10,000 and down to \$2,000, wherever the circumstances or the cause may be of particular interest.

Collision No. 2, occurring about 4 a. m., was caused by a north-bound freight running 4 miles past the station at which it should have met a south-bound freight. The conductor of the north-bound train had tried to get the dispatcher to give him an order

TABLE NO. 1.—Casualties to passengers, employees, and other persons.

	Passengers.		Employees on duty.		Employees not on duty.		Other persons not trespassing.		Trespassers.		Total persons.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collisions.....	47	1,014	85	817	2	86	1	27	21	15	156	1,959
Derailments.....	15	816	110	514	4	6	..	22	18	35	147	1,393
Accidents to trains, cars, or engines, except collisions, derailments, and boiler explosions.....	1	39	5	165	...	2	1	17	2	9	9	232
Bursting of, or defects in locomotive boilers or boiler attachments.....	...	2	9	305	...	...	...	...	...	1	9	308
Total train accidents.....	63	1,871	209	1,801	6	94	2	66	41	60	321	3,892
Accidents to roadway or bridges not causing derailment, such as fires, floods, landslides, explosions, etc.....	...	2	...	6	...	...	1	3	...	...	1	11
Coupling or uncoupling cars (does not include accidents with air or steam hose).....	...	...	56	722	...	...	...	...	...	...	56	722
While doing other work about trains (not in shops or engine houses) or while attending switches.....	...	1	45	4,833	...	3	...	7	...	...	45	4,844
Coming in contact, while riding on cars, with overhead bridges, tunnels, or any signal apparatus, or any fixed structure above or at the side of the track.....	4	14	25	443	...	1	1	3	13	33	43	494
Falling from cars or engines.....	22	102	113	1,397	3	18	4	20	111	199	243	1,736
Getting on or off cars or engines.....	25	687	42	1,843	11	88	4	47	145	481	227	3,146
Other accidents on or around trains not here named.....	1	988	8	241	...	21	2	122	5	74	16	1,446
Being struck or run over by engine or car at stations or yards.....	14	25	183	361	22	24	37	96	251	303	507	809
Being struck or run over by engine or car at highway grade crossings.....	...	...	6	16	5	1	267	598	35	31	313	646
Being struck or run over by engine or car at other places.....	3	2	172	138	30	21	27	35	874	385	1,106	581
Other causes.....	3	130	20	347	2	41	8	394	37	141	70	1,053
Total, other than train accidents.....	72	1,951	660	10,347	73	218	351	1,325	1,471	1,647	2,627	15,488
Grand total.....	135	3,822	869	12,148	79	312	353	1,391	1,512	1,707	2,948	19,380

to run to D, but did not succeed; but the name of this place—D—appears to have stuck in his mind, and in reading his order to the engineman he read that name into it, though the order plainly read E; and E was the station that the train ran past. The report says that the engineman repeated the order to the conductor, but nevertheless the error went undetected. A brakeman of the train had seen the order and had read it correctly, but he was asleep in the caboose when certain south-bound trains were met, and when his train left E he assumed that all south-bound trains, for which his train should wait, had passed.

Collision No. 3, occurring at 6:27 p. m., was due to mistakes and confusion in the delivering of meeting orders on the part of telegraphers, to lack of care on the part of the conductor and engineman of a train, and to failure to carry out manual block signal rules. The trains involved were No. 6, running eastward from A to B, C, D, E, and F, and No. 1, running in the opposite direction, both regular passenger trains. The dispatcher, finding that train No. 1 was a little late, sent order No. 22, requiring these trains to meet at C. This order was sent to the eastbound train at A and to the westbound at F; and it was also sent to C,

TABLE NO. 2A.—CAUSES OF 43 PROMINENT TRAIN ACCIDENTS.

[NOTE.—R stands for rear collision; B, butting collision; M, miscellaneous collisions; D, derailment; P, passenger train; F, freight and miscellaneous trains.] COLLISIONS.

No.	Class.	Kind of train.	Killed.	Injured.	Damage to engines, cars and roadway.	Reference to record.	Cause.
1	M	F. and F.	2	1	\$2,072	11	Freight train ran into side of work train. Dispatcher had allowed work train on main track until 10:30 p. m., without sending a copy of the order to other trains. There was only one train in the vicinity and the dispatcher assumed it would be impossible for this train to reach the work train by 10:30.
2	B	F. and F.	1	1	3,300	49	North-bound train ran past meeting point. (See note in text.)
3	B	P. and P.	2	29	3,550	86	Confusion of meeting orders and failure in block working. (See note in text.)
4	B	P. and F.	0	93	3,625	12	Motorman of north-bound electric work car ran past a meeting point fixed by dispatcher's order. (See note in text.)
5	B	F. and F.	0	3	4,400	54	Dispatcher, 27 years old, with three years' experience, issued "lap orders." His conduct in connection with these orders is characterized in the report as gross negligence.
6	R	P. and P.	2	38	4,800	42	Passenger train entered station at excessive speed. Two passengers killed.
7	B	F. and F.	0	0	5,030	8	Operator in receiving order omitted four words. He claims that the words must have been cut off by the sticking of the relay, but another operator at the same time received the same order correctly.
8	B	F. and F.	4	3	6,461	94	False clear block signal given by signalman who was intoxicated. (See note in text.)
9	B	P. and F.	0	22	6,481	89	Failure to deliver meeting order. (See note in text.)
10	B	F. and F.	2	5	7,650	52	Agent accepted hold order after train had passed; was confused as to fourth and fifth sections of a freight, and made wrong entries on block sheet.
11	M	P. and F.	1	14	8,000	10	Coal cars ran away from mine. (See note in text.)
12	B	P. and P.	2	20	8,430	88	Error in meeting order. Operator of 10 years' experience wrote "east" in place of "west," but according to dispatcher repeated the order correctly. Conductor and engineman at fault for accepting order, as it bore internal evidence of irregularity.
13	B	P. and F.	0	9	8,950	45	West-bound freight failed to clear east-bound 5 minutes, as required by rule; east-bound ran past train-order signal.
14	B	F. and F.	0	6	10,776	84	North-bound train encroached on time of south-bound. South-bound also left station a little ahead of time; dense fog prevailed. (See note in text.)
15	R	F. and F.	1	1	12,000	81	Brakeman, who was killed, failed to properly protect train by flag; occurred in fog at 1 a. m.; train moving slowly.
16	B	P. and P.	2	82	13,200	87	Misplaced switch at crossover.
17	R	P. and F.	0	2	15,000	80	Excessive speed under permissive block signal.
18	R	F. and F.	0	2	16,792	44	Fast freight train ran too fast under caution signal and disregarded distant signal at entrance of next block section.
19	B	F. and F.	1	4	17,319	7	Conductor misread name of station in meeting order. Engineman killed. There were two names in the body of the order and the conductor seems to have confused them.
20	R	P. and P.	9	17	18,000	41	Disregard of red light by engineman of passenger train. (See note in text.)
21	B	F. and F.	4	8	18,000	51	Operator of two years' experience and two months in the service at this office, accepted an order after train had passed. This collision occurred at 2:20 a. m. The operator disappeared next morning.
22	B	P. and F.	12	24	18,871	46	Conductor and engineman of west-bound work train waiting for two east-bound passenger trains started out after only one of the trains had passed. (See note in text.)
23	B	F. and F.	6	5	19,175	47	Operator failed to deliver order. (See note in text.)
24	B	P. and F.	20	39	27,758	3	Failure to deliver telegraphic order. (See note in text.)
25	B	P. and P.	34	11	7,000	99	South-bound extra car (on electric railway) encroached on time of north-bound regular car. (See note in text.)
26	B	P. and P.	6	18	.....	100	South-bound extra passenger car encroached on time of regular north-bound car. (Electric Railway.)
Total	.....	.....	111	457	\$266,640	...	...

DERAILMENTS.

1	D	P.	0	7	\$2,200	16	False clear night signal at derailing switch. Red glass had been broken and light showed white. Cause of breakage of glass undiscovered.
2	D	P.	0	7	2,675	24	Unknown. (See note in text.)
3	D	P.	0	0	3,285	107	Loose tire on wheel of tourist sleeping car.
4	D	F.	0	0	5,202	116	Train of 43 empty cars running through a sag; the rear part of train pushed the cars together and forced one of them off the track.
5	D	P.	3	40	5,700	123	Unexplained. Speed 60 to 65 miles an hour. The tender was the first vehicle to jump the track.
6	D	F.	0	1	6,600	103	Cars ran off end of track on trestle, because brake chain became knotted.
7	D	P.	0	25	7,461	114	Switch thrown immediately in front of fast train by apprentice signal man, without instructions. Signal man was engaged at telephone. Train derailed by running at high speed through crossover.
8	D	F.	0	3	10,360	102	Fault in brake rigging of rear driving wheel. Wreck partly destroyed by fire due to spontaneous combustion.
9	D	P.	14	22	10,500	115	Washout 12:25 a. m. (See note in text.)
10	D	F.	0	0	10,700	20	Broken wheel; seam in flange.
11	D	P.	0	15	12,124	14	Broken angle bar.
12	D	P.	3	35	12,147	32	Accidental obstruction. (See note in text.)
13	D	P.	0	6	13,700	67	Misplaced switch. Switch had been left wrong by employee of bridge and building department. Engineman and fireman held not blameworthy.
14	D	F.	1	1	14,510	69	Improper handling of air brakes approaching crossing on descending grade of 1 per cent. Engine ran off at derailing switch.
15	D	F.	0	0	14,699	68	Accidental obstruction (steel brake beam lying on track).
16	D	P.	0	5	15,000	36	Excessive speed on sharp curve; 11 p. m. Engineman of 19 years' experience.
17	D	P.	2	6	15,290	111	Explosion of locomotive boiler. Fire box failed by weakness due to excessive heat, caused by low water. Engineman and fireman killed.
18	D	P.	2	3	15,700	15	Bridge weakened by fire. Engineman and fireman killed. Train approached bridge over curved line and conductor saw fire and applied brakes, but too late. Cause of fire unknown.
19	D	P.	2	8	16,450	39	Excessive speed (estimated 70 miles an hour) over curve of 10 degrees. Engineman and fireman killed.
20	D	P.	4	36	21,500	28	Misplaced switch. Primary responsibility rests on conductor and brakeman of freight train which had used the switch a short time before, but the engineman and fireman of the passenger train, who were killed, are held to have been partly responsible, as the switch could have been seen in season for slackening speed.
21	D	F.	0	1	21,800	22	Tires of driving wheels of engine slipped and caused rails to spread. (See note in text.)
22	D	F.	0	0	28,307	76	Excessive speed with ore cars suitable to be run only at low speed.
23	D	F.	2	2	31,700	78	Runaway on steep grade. (See note in text.)
Total	.....	.....	33	223	\$297,610	...	...
Total collisions and derailments	.....	.....	144	680	\$564,250	...	...

the station where the trains were to meet. Subsequently, finding that No. 1 was losing time, the dispatcher determined to change the meeting point to D, one station farther east, and prepared order 27 to that effect. This order was sent to B for No. 6 and to E for No. 1. The operators at C and D did not answer promptly. As soon as this order was sent, and before it was repeated, the operator at E reported that No. 1 was coming, and the dispatcher then decided to leave in force the original order; so he told the operator at E and operator W at B to destroy order No. 27. This proceeding was proper, as the order had not been repeated. Operator W at B says that he did not understand the dispatcher; and he did not destroy the order. He had written on it, prematurely, the word "complete," which word, when accompanied by a notation of the time, makes an order valid for use. He then became engaged in other duties (selling tickets) and forgot about this unfinished order. At this time the night operator, S, came on duty and he (S), without consulting the day operator, delivered this unfinished order to train No. 6. He saw that the order bore the word "complete," but failed to notice that it lacked the time indorsement, which was an essential element. The conductor, engineman, fireman, and one brakeman of train No. 6 also accepted and read the order, not noticing this irregularity; and train No. 6 then proceeded from B. On arrival at C this train should have received a copy of the original order No. 22, fixing the meeting point at C (copies of meeting orders being regularly sent to operators at meeting points), but the operator at this station neglected to deliver this copy, and instead gave the conductor and engineman a clearance card, showing that he had no orders for that train and that the block section (C to D), which the train was to enter, was clear. He claims to have told the conductor by word of mouth that the clearance card would be valid only after the arrival of the westbound train, but this is not substantiated; and besides, oral instructions contrary to written orders are forbidden. Under the block-signal rules this clearance card could not be given until after receipt of word from D that the block section was clear and would be kept clear for train No. 6, nor should the card be used at all unless there were some good reason for not clearing the signal. Moreover, this operator but a few minutes before, as required by the rules, had promised D that he would hold all eastbound trains for the arrival of train No. 1. On this clearance card train No. 6 left C, and the collision occurred about 1 mile east of that place. Both of the men at B and the one at C had been in the employ of this company for several years, and all three were regarded as efficient operators.

The block-signal system in use on this line is the "Controlled manual," but there is no track circuit control, and the rules permit a clearance card to be given under certain conditions without putting the signal in the position to give a "proceed" indication. A card was thus given in this case, but without any reason or excuse. In consequence of the use of the same outdoor fixed signal for the two functions of a block signal and a train-order signal there is a complication in the rules concerning the use of a clearance card as a substitute for the giving of a proceed indication by the fixed signal, but it does not appear that this conduced to the commission of the error in this particular case.

Collision No. 4, which occurred on an electric road, was due to disobedience of a meeting order by both the conductor and the motorman of a northbound work train. Each of these men had received a copy of the order about 30 minutes before the collision, and it appears that both of them fully understood it. Neither had any other order in his possession at the time. The report says: "The motorman states that he was writing out certain freight bills and asked the conductor twice whether the southbound car had passed, and was assured that it had. The conductor states that he supposed the motorman would attend to the orders while he (the conductor) was looking around the cars, his attention being taken by some wires that were loose."

Collision No. 8, occurring at 3:30 a. m., was due to a false clear block signal. The signalman, disqualified by being under the influence of intoxicating liquor, gave a clear signal to a south-

bound extra train to enter a section already occupied by a northbound regular train. There was a dense fog at the time so that neither engineman had a view of the opposing train in season to slacken his speed. According to the rules the signalman at this point should give a clear signal only after receiving word from the train dispatcher. This signalman had been in the employ of the company as an extra man for about three months. His mental condition after the collision was such that no explanation could be had of his error. He was arrested and held for the grand jury on a criminal charge, but the result of the trial is not yet reported.

Collision No. 9, between a southbound passenger train and a northbound freight, was due to the failure of an operator to deliver an order to the southbound train. This train was to meet the northbound at H, and the order for it was sent to the operator at that point. The train made its regular stop there to meet a northbound passenger train and to take water, but as it approached the station the engineman sounded the regular whistle signal, indicating that he desired a clear train-order signal, and the operator, forgetting the order on his table, at once changed the signal to the "proceed" position. The operator is held negligent for not having reported to the dispatcher that the train was approaching the station, and also for neglecting to use the "telltale" device, an arrangement for covering the lever of the signal in such a way as to remind an operator of the presence of an order in his office in case he should inadvertently attempt to change the signal when it ought to be left in the "stop" position. After the train had left, he discovered the order lying on his telegraph table and immediately notified the dispatcher; but it was then too late to stop the northbound train. Up to the time of this accident this operator's record had been good. He had been at H two years and had had four years' experience in all.

Collision No. 11 was due to the presence on the main line of five coal cars, which had escaped control at a mine about a mile away from the railway, and had run to the main track before the men in charge could stop them. These cars had run away because of carelessness of men at the loading point in pushing a loaded car against four others which were standing on a grade with the wheels blocked, but with blocks not large enough to withstand the shock which they were given by the moving car. There is a derailing switch below the mines, which ordinarily would have thrown these cars off the track, but it had been closed a few minutes before by a switching crew, to facilitate their switching movements, and the runaway cars came along just as the engine had cleared the running track. There is no derail near the main line of the railway, the reason given for not having one at this point being that because of the presence of buildings close to the track there is no suitable place for a derail. The statement of the railway company says that, to provide against a collision of this kind in the future, it is proposed to install two derailing switches, so connected with each other that when one of them is closed, ahead of the switching engine, another one, in the rear of the engine, must at the same time be open.

Collision No. 14, between northbound and southbound freight trains, occurred about 6 a. m., in a dense fog. The northbound train had reached a point about 3,000 feet short of a switch, at a passing station, where it should have cleared the southbound train. The southbound train appears to have been a few minutes ahead of time. The evidence as to the precise time is conflicting, but the main responsibility is thrown upon the northbound train, as it was running in violation of the rule which required it to reach the meeting point and be clear of the main track before the leaving time of the southbound train.

Collision No. 20, killing 9 persons and injuring 17, occurred about 10:43 o'clock in the evening and resulted in the wreck of a sleeping car, which took fire from the locomotive that crushed it, and was completely destroyed. This sleeping car was the rear car in a passenger train which had been stopped for the purpose of making slight repairs, and it was run into by a following passenger train, after having been stopped about 25

minutes. The report says that the flagman of the standing train went back promptly a distance of about 2,400 ft., to a highway crossing and there placed a torpedo on the rails; and that there was a clear view from the standing train back for 2 miles to the station at D, the switch lights of which were plainly visible. The engineman of the second train appears to have taken no action toward stopping until after he passed over the torpedo, and even then the brakes appear not to have been applied with full force. The brakeman who went back with the red light and torpedoes says that he watched the approaching train from the time it started from D, and that he continued to give the stop-signal motion with his lantern until he was obliged to step off the track to avoid being run over. The train passed him at high speed. The conductor of the standing train saw the motions of the brakeman's lantern and heard the explosion of the torpedo. The sleeping car conductor was on the ground at the rear of the train, and he also saw the stop signals given and heard the explosion of the torpedo. The porter of the sleeping car also watched the brakeman and gives similar testimony. He says that he was sure that the brakeman went as far as the road crossing, because he saw the light of the brakeman's lantern reflected from the whitewashed wing fence of the crossing.

The engineman of the second train declares that he did not see the red tail lights of the standing train. He says that on hearing the torpedo he made a service application of the brakes. After the collision he went back to see if he could find the remains of the torpedo, using in his search a tail lamp which he found in the rubbish of the wreck. This tail lamp was afterwards picked up by a road foreman of locomotives and proved to be the one which was on the left-hand side of the rear of the car of the standing train.

The conductor of the second train heard the explosion of the torpedo and says that the air brakes were immediately applied, but only slightly; and that after application, and before the collision, they were released. The baggage man and the train porter in the baggage car of this train heard the explosion of the torpedo and spoke about it. This baggage man, who was entering on his record the pieces of baggage which he had just taken into his car, walked to the end of the car after hearing the explosion, and returned to the center and remarked to the porter that it was strange the engineer did not stop; all of this before the collision occurred.

The rear flagman of the second train did not hear the explosion of the torpedo, but he saw the flagman of the leading train standing at the side of the track as his (the second) train passed him. Immediately after the collision he went back to protect his own train and at the road crossing found the brakeman of the standing train.

The leading train had left its rear car at D and at the inquest held by the coroner testimony was offered to the effect that the tail lights (markers) were not transferred from this car to the car ahead, but besides the circumstantial evidence already noted, the report says that a trainmaster of the road was at D that night and that he noticed particularly that the markers were in place and brightly burning when the train departed.

The engineman of the second train was first employed by this company in 1881. He was dismissed in 1885 and was re-employed 4 months later. Nine years later he was out of the service temporarily by reason of a strike. In the 19 years since 1881 his record shows 20 suspensions or reprimands.

The conductor of the standing train was first employed by this road in 1894. Four years later he was dismissed for negligence but was re-employed within a month. Eleven months later he was dismissed again, and was re-employed on July 19 of the present year, or a little over one month prior to the accident. During the 11 years that he was out of the service he was employed on other roads, most of the time as freight and passenger conductor and as yardmaster, but during the past two years he was a farmer.

The brakeman or flagman of this train had been in the service 24 days. He is 23 years old, and his last work before coming to the railway was as a carpenter; but he had had railway experience as a fireman, baggageman, and clerk, aggregating 18 months. He was employed this year by an experienced trainmaster and, according to the report, he not only was found to possess the proper knowledge and intelligence to perform the duties of a passenger brakeman, but also is held by the superintendent to have done, in this particular case, all that could be expected of him.

Collision No. 22 was between a westbound extra freight train and an eastbound regular passenger train. It occurred on a curve where neither of the enginemen had more than a few seconds' view of the opposing train before striking it; and 12 passengers were killed and 18 injured. The tender of the engine of the passenger train penetrated the baggage car and the rear end of the baggage car penetrated the smoking car, and nearly all of the victims were in the smoking car. The extra freight train, after receiving orders to run from A to B, was moved some distance away from the station to the west end of a sidetrack, there to await the arrival of two regular eastbound passenger trains, the first one of which was 25 minutes late. After this first passenger train arrived and passed, the extra was started out; and it ran about 2 miles before the collision occurred. The conductor of the extra train states that he "entirely overlooked" the second train. The engineman sustained a fractured skull, and was so seriously injured that at the time the report was made he was not able to make any statement concerning his relation to the wrong movement of the train.

Collision No. 23 was due to failure of a telegrapher to stop a train for which he held an order. This operator was 20 years of age and had been in the service of the railway three months. Previous to this he had had eight months' experience on another road. In sending the order the dispatcher gave the usual signal on the wire and the operator responded with the letters "RD," indicating that he had displayed the red (stop) signal; and afterward the dispatcher again asked him if the signal was displayed and the operator replied in the affirmative. But after the accident he offered the explanation that the signal, when released by him, did not move to the stop position. The superintendent doubts the truth of this statement, adding that he has never known of a signal of this kind to fail in that way.

Collision No. 24, in which 20 persons were killed and 39 injured, was between a southbound passenger train and a northbound freight train. The passenger train was running at high speed. The cause was the failure to deliver meeting orders. The freight train was running northward from A to B, C, D, etc. An order had been sent to its conductor at A to the effect that the passenger train would wait at C until a certain hour. The dispatcher intended to send the same order to the passenger train at D, but "through oversight" failed to send it in season. Discovering this error, he then tried to send word to B to hold the freight there, but he did not succeed in doing this until after the freight had passed B, and the collision occurred between B and C. This dispatcher was 32 years of age, and had been in the service of the road seven years; his habits and character were "excellent," and his service "very satisfactory." Of the victims of this accident, nine (six killed and three injured) were trespassers, riding on the front end of the front car of the passenger train. It is supposed that these trespassers had boarded the train at its last stop, though no one saw them get on.

Collision No. 25, in which 34 passengers were killed and seven passengers and four employees were injured, occurred on an electric interurban railway and was between a southbound car running as an extra train and a northbound car running as a regular train. The southbound, which should have kept clear of the time of the northbound, ran past the sidetrack at which it should have waited and also past the next sidetrack; and the

collision occurred at a point on a curve where neither motorman had more than a short distance in which to see the opposing car. The collision occurred about noon. All of the persons killed were on the northbound car, which was completely wrecked. The southbound car carried no passengers. The motorman running the southbound car, who is principally at fault, had acted as motorman of the northbound regular train for 60 days previous to this collision, and he had been employed on this division of the road about six months, previous to which he was a motorman on city street railway lines. The report says that no statement has been secured from this motorman and that he is confined in an asylum. He is 35 years old. The conductor of this car, who is equally responsible with the motorman, is 23 years old. He was first employed as conductor on this line about 11 months previous to the collision, but had resigned and was out of the service until about one month before the collision.

Deraiment No. 2 was that of a train running about 50 miles an hour, and the first vehicle to leave the track was the tender. All of the cars in the train were derailed, but the injuries to persons were not severe. The officers of the road were unable to reach any positive conclusion as to the cause of this derailment, but they found a probable cause in the extremely tight coupling between the engine and the tender and to the fact the buffer plate on the engine was worn to a depth of about one-half inch, and the buffer plate of the tender was also worn some. The report says: "Although there were no marks to show that the buffer plate on the engine had tended to raise the tender, it is possible that it acted that way." The accident occurred on a curve of 3 deg. 3 min.; superelevation of outer rail 8 in.

Deraiment No. 9, which occurred in the middle of the night, was due to a washout caused by a cloudburst. The very unusual volume of water was held back by the embankment of the railway until it flowed over the top and crossed the tracks, and then a length of track about 350 ft. long was washed out, and, for a length of about 20 ft. the earth was washed away to a depth of 7 ft. Of the 14 persons killed, nine were passengers, three were trainmen, one was an employee not on duty, and one was a trespasser. The report says that this cloudburst was a most extraordinary occurrence. Two residents of the neighborhood, who have lived there for 30 years, says that 7 in. of water fell in about 30 minutes. At the next station east of the point of trouble very little rain fell, while at the next station west, although there was a hard rain, it was not such as to cause alarm. A number of highway bridges were washed away.

Deraiment No. 12, in which the engineman, fireman, and baggageman were killed, was due to the displacement of a door on a freight car by the shifting of the goods within the car; this door, falling from the car in an eastbound train, lodged on the rails of the westbound track, and it was struck by a passenger train running at high speed. The engine and baggage car were overturned, and four other cars were derailed. This accident occurred about 3 o'clock a. m. The first wheels to jump the track were the trailing wheels of the engine. All the rest of the train remained on the track for over a mile.

Deraiment No. 21 was caused by a freight train becoming uncontrollable on a descending grade because of improper handling of air brakes by the engineman. By long-continued application of the brakes on the driving wheels of the engine the tires on these wheels became so hot that they slipped laterally on the wheel centers, and as a result they produced abnormal side pressure on the rails, forcing one rail out of place and derailling the engine and a number of cars. This accident occurred at 2 o'clock in the morning, and the trainmen had been on duty 10 hours and 10 minutes. The testimony concerning the conduct of the engineman in regard to the handling of the air brakes is not clear, but it appears that after finding that the speed of the train was not slackening properly he took a stick (to use as a lever) and went back over the cars to set hand brakes; and all the time that he was away from the engine the driving-wheel

brakes, worked by "straight" air, remained set. The engine was in good condition and the air brakes had been working properly, and at the commencement of the descent there was a sufficient supply of air. The brakemen were held blameworthy for not setting hand brakes. These men claim that they did not hear the brake signal which was given by the engine whistle. The conductor, who was in the caboose making out reports, was held blameworthy for not noticing that the train had passed a certain place where it was usual to stop for the purpose of cooling the wheels.

Deraiment No. 23 was caused by a freight train becoming uncontrollable on a descending grade of 78 ft. per mile because of improper management of the air brakes. This derailment occurred about 2 a. m. The train consisted of an engine, 62 cars, and a caboose. In consequence of the excessive speed the twenty-third car in the train was derailed at a sharp curve, and, with 33 cars next behind it, was piled up in a very bad wreck. The whole mass took fire and was burned up. The origin of the fire is unknown, but it is conjectured that it started in a car loaded with oil cake. The engine, with 22 cars, ran a half-mile farther and was derailed and wrecked at a frog because of the looseness of the tires of the driving wheels, which had become heated by the brakes being kept set for too long a time. It is estimated that the speed of the train rose to 55 miles an hour or higher. The engineman was killed, and the precise nature of the trouble with the air brakes can not be made out. So far as can be discovered the engineman had applied and released the brakes too frequently to admit of recharging the auxiliary cylinders. The testimony of the surviving members of the crew indicates that he did not apply the air brakes until some time after giving the whistle signal for the application of the hand brakes.

The engineman was 66 years old and the company gives him a good record. The air-brake apparatus was connected for operation on all the cars of the train but one. The conductor had noticed the excessive reduction of the air pressure as shown on the air-brake gage in his caboose, but when he finally opened the conductor's valve it was too late for this to have any effect on the wheels.

The bulletin contains the usual tables showing details of accidents to employees in coupling and uncoupling cars; nature of injuries in these accidents, and detail causes of accidents in which men fell from cars, engines, etc.

ACCIDENTS ON ELECTRIC RAILWAYS.

Table No. 1E shows casualties on electric railways in train accidents as follows: 41 passengers and 5 employees killed; 422 passengers, 44 employees, and two others persons injured; in other accidents, 7 passengers, 14 employees, and 79 other persons killed, and 365 passengers, 70 employees, and 167 other persons injured. This makes a total of 146 persons killed, and 1,070 injured. Adding to this the industrial accidents, the grand total is 148 killed, and 1,150 injured. The collisions on the electric railways numbered 61; damage to cars, etc., \$30,780; derailments 17, damage \$5,555.

FOREIGN RAILWAY NOTES.

The Chilean government has set aside \$522,139 United States gold for the construction of 30 miles of railway connecting Cajon and Llaima.

The railway commissioner of South Australia has given orders for the construction of a truck to be run on one rail for experimenting with the monorailway as applied to conditions in South Australia, where the necessity of cheap construction in sparsely populated districts is very great. If the experiment is successful, the government intends to build some small lines as feeders to main lines, at a probable cost of about \$2,500 per mile, including rolling stock.

DIFFICULT LOCATION WORK IN GORE'S CANYON.

BY J. J. ARGO.

Locating Engineer, Laramie, Hahn's Peak & Pacific Ry.

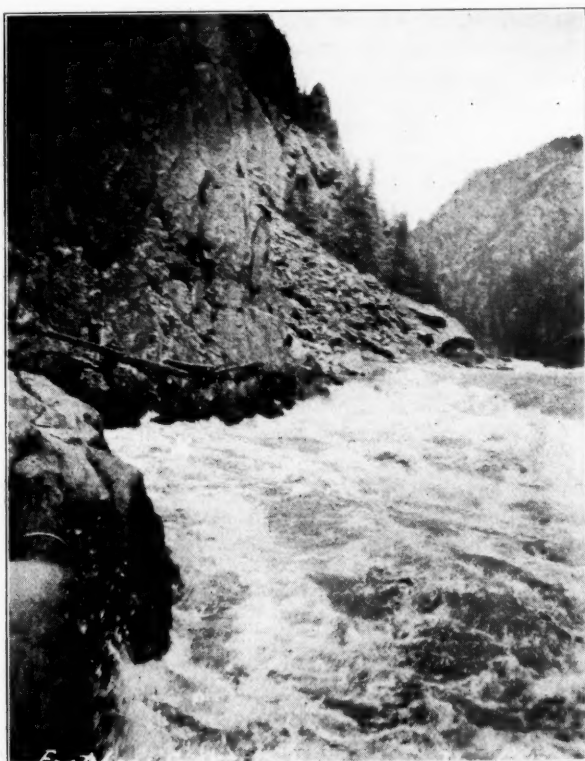
The writer was sent out as locating engineer for the Denver, Northwestern & Pacific, when this road was under construction, to locate a line through Gore's canyon of the Grand river in



Instrument Man Going Up the Canyon on Foot-Logs.

Middle Park, Colo. The railway company had had a long fight for the right-of-way through the canyon, and, as the case had just been decided in its favor by the secretary of the interior, its plans required that the final location be made at once.

Gore's canyon is a deep, narrow gorge, about six miles long. For a considerable part of the distance it is what is commonly termed a box canyon; that is, the walls rise directly from the water's edge. The Grand river, a narrow stream from 100 to 200 ft. wide, flows through the canyon over a bed of large boulders and has a fall of about 2 ft. in 100. The amount of



Cliff With Foot-Logs in Place and Slide Rock in Background.

water is comparatively small, except during the months that the melting snow from the main range of the Rockies raises it from 10 to 30 ft. It then completely fills the bed of the stream between the canyon walls. The canyon was almost inaccessible at all times, although it was possible when the water was low, or when the river was frozen in the winter, to get through, with a good deal of difficulty. During the high water season it was impassable, and it was during this period that the location had to be made. The sides of the canyon are in some places ragged granite bluffs rising to a height of 3,000 ft., and in other places they are coarse slide rock standing at about the angle of a rock dump. Through this slide rock run the small streams which cut the sides of the canyon. It is possible to walk or climb over the slide rock, but the bluffs cannot be scaled except by artificial means.

We were able to work over the bluffs by the use of swinging ropes from above, as it is nearly always possible for a skilful climber to find enough points from which such ropes can be hung, by making his way up the cliffs, usually at the ends where they adjoin the slides, and taking advantage of the ledges and



Placing Foot-Logs on Face of Cliff.

crevices. Then an active man, by holding to these ropes, can scramble over an almost perpendicular cliff. An instrument man, with his instrument strapped on his back and a rope around his body safely securing him in case he should slip, can go almost anywhere and set up his instrument in seemingly impossible places. By this means a preliminary or angle line was run, and 10-ft. contours obtained, from which we were able to make up our map and projected location. It was possible to get over any of the bluffs in this way, but it was tedious, and when we were working a short distance from the mouth of the canyon a whole day would be spent in getting to and from work.

It was necessary to devise some means of getting to the interior of the canyon in a shorter time, but it seemed at first almost impossible. The opposite side of the canyon was equally inaccessible, so that it could not be used for triangulation. No boats of any kind could be used in the swift and treacherous stream. It was possible to climb up the slides out of the canyon

in some places, but owing to the height of the canyon this took up too much time. We finally adopted the expedient (which was original with me, though it may have been used by others under similar conditions), of swinging foot logs along the face of the bluffs over the river, by means of wire rope attached to steel pins fastened in the rock. It was no easy matter to do this with hastily improvised means and limited time, and putting up these foot logs was the most strenuous work of the survey. Our method of placing the logs was as follows: Pine logs from 6 in. to 10 in. in diameter and about 16 ft. long, which grew on the rock slides of the canyon, were cut and taken down to the river bank, steel rope, $\frac{5}{8}$ in. in diameter was fastened to each end of the log. We used pins of drilled steel about 16 in. long, sharpened with a flat point, for supports. These were driven into crevices in the rock in most cases, or, when this was not possible, holes were drilled for them. Beginning at the up-stream end of the bluff, a pin was located at as near the proper height as possible, a log was floated down the river to its position, and the upper end of the log raised to the proper height and swung by the rope from the pin. A rope was then dropped from the top of the bluff and attached to the lower end of the foot log, allowing men located above to hold the lower end of the log at the same height as the upper end, while a man walked out on the log and put in the steel pin from which to swing the lower end of the log. Then another log was floated down, its upper end attached to the same pin to which the lower end of the first had been fastened and its lower end raised by the rope from above while a man went out on it and fastened another of the pins in the bluff. After the logs had been placed for a short distance by this method, the whole party handling the logs would be working on these shaky supports, and the swift current made it very difficult to handle the logs in that situation. Sometimes the current was so strong that in floating down the logs we would lose log, rope and all. Sometimes the steel pins, apparently solid, would drop out. This danger was provided against by putting in a large number, and by binding the ends of the logs together solidly. The ropes swung from the top of the cliff continually started loose rock which dropped all around us, and one or two instruments were smashed by such rocks. One of the party dropped into the river from one of the foot logs, but was a good swimmer and managed to get away from the swift current into an angle of the bluffs and get out safely. There were no serious accidents during the work.

After we had all of the inaccessible bluffs strung with foot logs, the work of setting stakes was arduous but interesting. The canyon, while exceedingly rugged, has a comparatively straight course, and the alinement of the road through it is nearly all good, with only four short tunnels.

The Chilean and Argentine governments have agreed on a plan to connect the two republics by another railway some 400 miles north of the present Transandean Railway between Valparaiso, Chile, and Buenos Aires, Argentina. It is proposed to have this line of the same gage all the way, thus avoiding the transfer of freight, as is the case via the present Transandean line. Such a line would open up some rich mineral country on the Chilean side, as well as rich mineral and agricultural lands on the Argentine side. This line would require a tunnel of only 1,640 feet to pierce the Andes at the point selected, and only about 36 miles of road is needed to connect it with the Longitudinal Railway now building and the port of Caldera, Chile, which would bring the farms of Argentina much nearer the nitrate fields of Chile than the present route. The Argentine government has made the appropriations for that portion of the road, and from the sentiment in Chile there seems no doubt but that Chile will be ready to connect as soon as a tunnel can be completed through the Andes. The Chilean section would open up a country now occupied by 30,000 people, which number would be greatly increased, since that part of the country is rich in minerals.

INEQUITABLE MAIL-PAY RATES.

The Committee on Railway Mail Pay, Julius Kruttschnitt, chairman, has issued a pamphlet containing the facts and arguments which it proposes to present to the government in asking: (1) that the postmaster general be authorized to allow the railways compensation for space in apartment cars [an apartment is a space less than a whole car, used for assorting mail]; (2) that the "short line" railways be not required to carry the mail from stations to post offices (as is required under the present law, in case the post office is within 80 rods of the station); and (3) that the weighing of the mails, to fix a basis for the price, shall be made every year instead of once in four years. The pamphlet opens with brief historical notes. As late as 1842 only three-quarters of the railway mileage of the country was utilized for mail service. The present tariff of the rates of pay, based on weight, combined with additional rates based on space, was originally adopted in 1873, but has been modified. In 1876 Congress ordered a reduction of 10 per cent., and in 1878 a further reduction of 5 per cent. Then in 1907 there was a further reduction of 5 per cent. on the heavier routes. This refers to the rates (based on weight) for transportation. The rates of pay for post office cars (space) separate from the transportation, which were established by the law of 1873, were reduced in July, 1907, on all cars 45 ft. long or longer. In 1907 the postmaster general reduced the transportation pay about 12 per cent. by ordering that when mails were weighed the average weight per day should be ascertained by dividing the gross weight by the whole number of days included in the weighing period, thus including Sundays, which theretofore had been excluded.

The volume of mail handled by the post offices in 1910 was so much larger than that of 1907 that the increase in revenue was \$40,543,652, and during the same period the increase in expenses amounted to \$39,737,936; but none of this increase went to the railways. On the contrary, they received \$352,760 less in 1910 than in 1907. For the year ending June 30, 1910, the total amount received by the railways for transportation of mails was about \$44,000,000, and for railway postal cars about \$5,000,000, or a total of about \$49,000,000; whereas the city and rural delivery services cost \$68,500,000. The information lately gathered by the post office department concerning the cost and revenue of railway mail service shows that on the railways reporting (77 per cent. of the railway mileage of the country), the railways received from the express companies 19 per cent. more and for passengers 37 per cent. more per car foot mile than is received for carrying the mail. While the mail has occupied 9.32 per cent. of the space in trains, as measured by car foot miles, it produced only 7.08 per cent. of the revenue. The express companies, occupying 10.67 per cent. of the cars, pay 9.66 per cent. of the train revenue.

The railways carry postal clerks free, not only when on duty but to and from their homes, and the inspectors, etc., of the post office department ride free. In case of accident, the company must settle with these men the same as with a passenger, but the express companies do not require this. The government pays for 1,400 railway post office cars, but there are 3,800 parts of cars, fitted up with the same conveniences, for which no space rate payment is made. No allowance is made for the frequency of trains nor for speed. It is estimated that the weight of mail increases at the rate of 6 per cent. per year, yet the railways cannot have the price readjusted oftener than once in four years.

The pamphlet contains a list of the roads which organized the committee on railway mail pay; and the members of the committee are the following: J. Kruttschnitt, Union and Southern Pacific Systems; Ralph Peters, Long Island; Chas. A. Wickersham, Western of Alabama; W. W. Baldwin, Chicago, Burlington & Quincy; Frank Barr, Boston & Maine; W. W. Atterbury, Pennsylvania; C. E. Schaff, New York Central; C. R. Gray, St. Louis & San Francisco.

THE EXISTING RAILWAY SITUATION.*

BY H. U. MUDGE.

President, Chicago, Rock Island & Pacific.

The weak point in the railway situation is that the railways do not agree. One railway company, by its action, may reduce any rate to all competitive points. It requires uniform and concerted action to increase a single rate. It will be seen, therefore, how difficult it is to make any rate increases, and it was only in the face of the most urgent necessity that action was taken looking to some increases in freight rates.

The occurrences leading up to the present railway conditions are about as follows:

In 1907 there was a large increase in the rates of wages paid all railway employees, followed by a severe decline in business. It seemed at the time necessary to either restore the wages to the old basis or increase the transportation rates. The railway companies were told by the authorities in Washington that to decrease wages at that time would only accentuate the panic and were told by the shippers that this, of all others, was not a time to increase freight rates. It was in vain that many of the railway managers explained that with the ever increasing cost of labor and material and the constant increase in cost of operation through state and federal requirements, such as the Nine Hour Law for telegraph operators, Self-cleaning Ash Pan Law, Employers' Liability Law, Safety Appliance Laws, the Electric Head Light Laws in several of the states. Full Crew bills in various states and many other things, that an increase in rates was inevitable, if not now, then some time later; if not under private ownership, then under national ownership after the roads had been driven to the wall.

However, the roads pulled through this panic without reducing wages or increasing freight rates, but by reducing expenditures for maintenance of way, structures and equipment, i. e., taking it out of the property. Business conditions improved and the roads began to put back some of the money withheld, but in the fall of 1909, before they were anywhere near caught up, the labor organizations began to clamor for another large increase in wages. This was denied by the general managers on the ground that the time was not yet right for another general increase. In the first case, that of the switchmen in the northwest, arbitration was offered by the roads but declined by the men, and a strike ensued. Organizations in other sections followed and arbitration was resorted to with the decision in every case that the men were entitled to substantial increases because of the increased cost of living. Practically all of the railway labor organizations have received increases in wages, except two, and those are now under consideration. That of the engineers is now being voted upon by the men as to whether they will accept the 9½ per cent. increase offered by the managers, or whether they will strike or take other means to endeavor to enforce their demands. [Since this was written the raises, amounting to 10 per cent. or more, has been given the two organizations referred to, the engineers and conductors.]

During all this time there have been many rate hearings and decisions covering adjustments between communities, such as the Spokane, Missouri River, and Texas Cattle rate cases, in all of which the revenues of the roads were, or will be, materially reduced, if the decisions stand as rendered. There have been also important reductions in intrastate freight and passenger rates by the various legislatures and state commissions, some of which have been overruled by the courts, and others are still being contested.

Someone must eventually foot the bill. The officers of the railways believed that some portion of their added cost of living should be offset by slight increases in freight rates on commodities on which the freight rate is almost infinitesimal as compared with the price of the article transported, and which freight rate in-

crease, if added to the price, would make no noticeable difference in its cost to the consumer. They felt that with the general downward revision of the average rates, caused by these numerous decisions, they must initiate some slight increases in order to partially offset this general downward tendency.

The railways have placed this matter fairly before the Interstate Commerce Commission. Insofar as the western roads are concerned, the amount of the increase asked for would not nearly cover the increases in wages made during the present year, and I doubt if it would equal the amount of reductions made by the decisions above referred to, but the outcome is awaited by the railway managers and by the investing public with a good deal of concern.

During all of the discussion and agitation attending the enactment of the Hepburn Law and the Mann-Elkins Law, there were many far-seeing railway men who thought that the additional authority conferred upon the commission would be beneficial to the country and to the railways, and there were other men, whose views were entitled to equal consideration, who felt that to place the life and liberty of so much capital absolutely under the control of a commission that might be swayed by political considerations was, to say the least, a dangerous experiment and almost sure to result in disaster. It seems, therefore, that the outcome of the present controversy is looked upon by men holding both these views as having a much greater importance than the mere question of the increase in the revenue involved.

The states through which the Rock Island operates have, for the most part, been favored with excellent crops and we expect to be quite busy for the next three months in moving them. There does not appear to be a tendency toward business expansion at the present time. While there are those who are willing to branch out, the bankers and capitalists do not seem disposed to furnish money for these undertakings in view of the present conditions, i. e., there seems to be a tendency to lay low until the atmosphere clears up a bit.

The railways made quite heavy expenditures last year for rails and equipment, and so far as I can learn, their expenditures on these accounts for the next ten or twelve months will be very light. If I am correct, the rail mills and car and engine manufacturers will find themselves short of orders in the near future. This, of course, will throw a considerable number of men out of employment and will affect the lumber, fuel and steel markets, and it seems to me must, of necessity, make things very quiet for a time. My personal opinion is, therefore, that we are in for a period of non-expansion and that the length and severity will depend largely upon the trend of public opinion with reference to the rights of the railways.

This western country is a country of wonderful resources and it is only because of this that we have survived the terrific onslaught made on large capital. I am, by temperament, an optimist. I believe in the West, and I believe in the western people. I believe that they mean to be fair and will be fair when they have time to learn the facts and the effect of this continual hammering of the real industries of the country by the so-called politicians. The railways can adapt themselves to almost any condition, if the condition is stable.

The railways have made wonderful strides in the matter of efficiency and the unit costs of transportations, but they have not been able to offset the heavy increases in wages, cost of material and cost of government regulation of operating matters, and at the same time the serious reductions in rates by government and state regulations. They can make still further reductions in unit costs through better efficiency, better tools and machinery, revision of grades, additional double tracks and in various other ways, but, for the most part, these economies must be preceded by heavy initial expenditures. Practically all of the industrial plants that have effected large economies have first replaced their plants with modern ones and have been permitted to charge sufficient prices to enable them to recoup themselves for these expenditures. This they are able to do by a beneficent government by means of a high protective tariff. The railways are

*This was written for the press by Mr. Mudge in response to several requests for an expression regarding his views on the existing railway situation.

not asking for a bonus of this kind. They are merely asking to be allowed an even break. They are willing to pay their employees more than twice as much as is paid in other countries and they are willing to furnish transportation at less than one-half the charges made in other countries, and they only ask that they be allowed to charge a sufficient tariff to enable them to secure money to do what the public requires, viz., furnish a safe and efficient service and still allow a sufficient return to capital to make the investment an attractive one, which it is not at the present time.

THE REPAIR TRACK AND ITS RELATIONS TO TRAFFIC.

BY F. F. B.

The repair tracks are the bane of the yard-masters' life. Usually they are a miscellaneous collection of stub tracks, assembled bit by bit, as the demand for space increases, in most inconvenient portions of the yard; and their inconvenience is a constant cause of friction between the repair track foreman and the aforesaid official. But in the proper conduct of repair track work there is more that affects the prosperity of the road than appears upon the surface.

At many division points, a switch engine and crew are regularly assigned to the repair tracks, but usually do not earn half the cost. The repair track foreman generally maintains that he cannot get along without the engine, but systematizing the work, from the yard up, often brings better results without it. A check on a certain system at several division points in competitive territory the past year disclosed the following conditions:—Instances of as high as fourteen days' detention on commercial freight, one to three days' delay on the part of the yard-master getting a car placed on repair track; three days' delay in repairs, or, perhaps five or six awaiting transfer, delay in getting car out after repairs had been made, and another, an inexcusable delay, in moving a car out of the yard.

The term "dead freight" (lumber, coal, etc.), is misleading. The consignee of this particular car may be losing money on a contract, or a plant may be compelled to close down for lack of fuel, and if he be located in competitive territory, he is going to the X, Y & Q road and his business will be lost. In times past, he might have been placated by a pass, or a rebate, and enticed back, but that day is past, and the only lever that is left now is *service*. That only will retain the old patrons and get new ones.

Consider, first, location and arrangement. At most points, especially in Western territory, there should be at least six tracks, of capacity suitable to the amount of repair work; one for east or north-bound loads, one for west or south-bound loads, one for system empties, one for foreign empties, one for heavy repairs, and one for the storage and cleaning of refrigerators or other special service cars. Many roads having a heavy fruit trade store their surplus refrigerators at the division points, and have them all overhauled and repaired before the season commences. All of these tracks should be accessible from both ends, except that stub tracks may be used for heavy repairs if necessary. The foreman should have wheels located at ends of certain tracks, so that cars requiring new wheels may be properly placed when set in.

It is a bad policy to have repair tracks lead off the main line, as it is not practicable to place, or switch a string of "chain-ups," cars off center, etc., near the time of main line trains. Car inspectors in yard should mark cars "heavy," "for transfer," or "for wheels," as the case may be, so that cars may be properly placed at one handling. Repair tracks should be pulled at the close of the day's business, or before if they are ready; or when a portion of them are ready. During the night, after each incoming train has been switched, take the bad orders to the repair track, each crew to set and space cars handled by it. Do not "sluff" the bad orders off all night, and take a chance on being able to get them placed before the day crews come on. The chance may be lost; and besides the track they are occupying in

the yard may be needed. Place all merchandise and perishable loads "first out," so they can be grabbed and started on their way as soon as repaired.

The repair track foreman is to be responsible, of course, for the protection of his men, and of contents of cars undergoing repairs. Furnish him with a list of all loaded box cars and contents, and require him to advise the yard-master as soon as repairs have been completed on perishable or time freight. During the day, if a track is completed, or a portion of it, it should be pulled and again filled. Have a car checker or some other competent person take a check of the tracks at the close of the day. The switch crew should not be sent to pull tracks and allowed to take out everything with the "bad order" mark off. Note on the list any cars that are jacked up. Company material should not be transferred, when possible to divert, neither should commercial coal if company coal of same quality can be substituted.

The section foreman usually has to furnish men for transferring lading of bad orders, and he is apt to delay unless followed up. If necessary to transfer a load of heavy timber, bridge steel or machinery with the crane car, it should be done immediately, as the wrecker may be ordered out at any moment, to be gone a day or more. A good order car should never be placed on the repair track, because it came into the yard with a bad order chained to it. The yard master should forward loads received from the repair track in preference to all other loads except perishable and merchandise. A good result can be obtained by a comparison of the average delay in yard to repair cars at the different division points, eliminating heavy repairs if deemed advisable. In this manner it is possible to trace delays, from the "on hand" reports which should show location of car each day, and then if the delay is the result of a lack of energy, discipline can be administered.

ELECTRIFICATION OF RAILWAYS IN GERMANY.

Largely for military reasons, little has been done up to the present time toward the introduction of electric-motor power on the Prussian railways. On electric roads the trains do not possess the independence of steam locomotives. The electric car is dependent on a power house and a set of electric wires, and injury to either of these may suffice to delay mobilization or supplying of troops for weeks. For the first experiments with electric-motor power on a large scale, the line from Magdeburg to Leipzig with its continuation, Leipzig to Halle, has been selected—entirely an interior line which does not lead to the frontier. Electric cars will be introduced on the first stretch from Dessau to Bitterfeld during 1911. The so-called "one-phase reversed current" will be used. Very successful experiments with this current have been made on local trains in the neighborhood of Berlin and Hamburg. On account of lack of water power in Prussia the necessary electricity will have to be generated by steam. The power house has been built by the General Electric Company, Schenectady, N. Y., in the neighborhood of Bitterfeld, where a plentiful supply of cheap lignite is obtainable. The power house is the property of the General Electric Company, which contracts to supply the necessary current to the government. The wires will carry 10,000 volts. Two kinds of electric locomotives will be used. Locomotives for passenger trains, weighing about 70 tons, have 1,000-h.p. and a speed of about 80 miles an hour. Freight locomotives have 600 to 800-h.p., and a speed of about 37 miles an hour. The most interesting feature of the locomotives is that, instead of transmitting power from the motor to the axles by means of cog wheels as heretofore, this is done by cranks and rods as in steam engines. The motor is situated rather high in the body of the locomotive, recent experience tending to show that a high center of gravity steadies the locomotive. The wires are hung as follows: Poles are 82 yards apart; the poles are connected by a heavy cable from which the electric wire is suspended by means of running knots at intervals of 6.5 yards. With the exception of locomotives the present rolling stock will be used without change.

General News Section.

At Pau, France, February 2, Martin, the French aviator, in a monoplane, flew for five minutes carrying seven passengers.

The Southern Pacific, dealing with a strike of enginemen and firemen on its lines in Mexico, has filled the vacancies by the appointment of Mexicans.

On the Canadian Pacific lectures are being given to large classes of employees on first aid to the injured. Classes have been formed on each of the six divisions of the road.

Flying above the circular track at Issy-Les-Molineaux, France, February 3, Mr. Say, competing for a prize, made a distance of 63 kilometers in 32 minutes, which is at the rate of about 73 miles an hour.

The Gulf, Colorado & Santa Fe has made a trackage contract with the St. Louis Southwestern for the use of the latter's track between McGregor, Texas, and Waco and the G. C. & S. F. will shortly run regular trains into Waco.

The French State Railways have ordered 50 ten-wheel passenger locomotives from the North British Locomotive Company, Glasgow, Scotland. This is believed to be the first locomotive order that France has placed in the British Isles for almost 30 years.

The Chicago & Western Indiana has ordered, from the Western Electric Company, telephone equipment for two circuits throughout the lines of its own road and of the Belt Railway of Chicago, with a total of 55 stations. There will be a message circuit paralleling the train dispatcher's circuits throughout.

The United States government has brought suit at New York for \$5,000 against the steamboat City of Lowell, owned by the New England Navigation Company, which, it is charged, was loaded with 1,800 persons last August on a voyage from New York to Poughkeepsie to witness the boat races; the number of passengers allowed by law being 800.

Justice of the Peace Edward A. Ransom, Jr., of Jersey City, N. J., on February 2 issued warrants for the arrest of eight men in connection with the explosion of dynamite at a dock of the Central of New Jersey in Jersey City February 1, when 24 or more persons were killed and over 150 injured. The persons thus charged with responsibility are the general freight agent of the road; the local freight agent; the dock master; a checker; the owner of the lighter; and the manager, the assistant manager, and the superintendent of transportation of the powder company.

For changing from steam to electric or electric to steam engines at Manhattan Transfer, near New York City, the Pennsylvania allows each train four minutes, and a record has been made up showing that, of the 108 trains that have to be changed daily, from 92 to 99 per cent. accomplish the process in less than the allotted time. On one day all of the trains went through with perfect records. The quickest time in which the exchange has been made, thus far, was 1 minute and 30 seconds. In warm weather when steam couplings do not freeze, a reduction may be made in the time allowed.

A bill has been introduced in the Arkansas senate to abolish the railway commission. The Little Rock correspondent of the St. Louis *Globe-Democrat* says that when the bill was first introduced it was considered a joke, but recent developments have convinced everyone connected with the state government that it is quite likely to be passed by the senate. The judiciary committee to which it was referred has decided, with only one dissenting vote, to recommend it for passage, and what action the house will take in reference to it is admitted to be in doubt. It is stated that if the bill is passed the governor will veto it.

The so-called "Chipperfield" commission of the Illinois legislature has made a report charging that a large amount of land held by public service corporations and other concerns on water fronts in the state of Illinois has been improperly acquired. The commission expresses the opinion that of the 265 acres of lake front in Chicago, from Fifty-first street to the Chicago river,

which the Illinois Central occupies, it has legal title only to a few small tracts. Similar charges are made against the Chicago Dock & Canal Company, the Wiggins Ferry Company of East St. Louis, the Lincoln Park commissioners and various other concerns. The recommendation is made that the attorney general proceed to test the rights of all persons and concerns holding lands, the title to which is in question, and that \$50,000 be appropriated by the legislature to defray the expense of litigation.

The explosion of gas which occurred at the Grand Central Terminal, New York City, December 19, causing the death of ten persons and damage to many buildings, was inquired into last week by a coroner's jury, but after six hours' deliberation the jury was unable to agree, and handed in two verdicts. Nine of the jurors, including the foreman, found that the accident was unavoidable, but a minority of three said it was due to the negligence of the company or companies in charge of the terminal. Albert Seagroatt, the motorman in charge of the engine attached to the cars which broke the gas pipe, had been arrested on the day of the accident but was set free after the action of the jury became known. Mr. Seagroatt was dismissed from the service of the road on January 17. His statement, as reported by the newspapers, was to the effect that he knew of no damage to the gas pipe until a long time after the cars ran over the bumping post. The rails were slippery on the morning of the accident, and there was no sand available on his engine.

We referred editorially last week (*Railway Age Gazette*, February 3, page 190) to the requirements of the pending post office appropriation bill, regarding the use of steel mail cars. The bill then referred to (H. R., 31, 539) has been passed by the house, but the senate committee has accepted certain recommendations from the post office department for its modification, which, it seems probable, will be adopted by Congress. Under the bill as it is proposed by the senate committee to amend it, it is provided that after July 1, 1911, no pay shall be allowed for the use of any wooden full railway post office car unless constructed substantially in accordance with the most improved plans and specifications of the post office department for such type of cars, nor for any wooden full post office car run in any train between adjoining steel cars or between the engine and steel car adjoining, and that hereafter, additional equipment accepted for this service shall be of steel construction or with steel underframe, if used in a train with a majority of cars of like construction. It is provided further, that after July 1, 1916, the postmaster-general shall not approve or allow to be used or pay for the use of any full post office car not constructed of steel or other non-combustible material or with steel underframe; if such post office car is used in a train in which a majority of the cars are of steel or steel underframe construction. It will be noted that the clause as here proposed, does not limit construction to steel, but permits the use of other non-combustible material. Furthermore, under the original bill, the postmaster-general was not allowed to exercise any discretion whatever in administering the law, while under the present proposition, the postmaster-general may, on the application of any railway, and for good cause shown after hearing, extend the time for compliance by such railway with the foregoing provisions. The bill as passed by the house, would not have permitted the acceptance of any additional wooden cars, while the bill as it is proposed to amend it would, it would seem, bar the use of wooden cars only in trains in which a majority of the cars are of steel construction.

Some Absurdities of Railway Regulation.

Howard Elliott, president of the Northern Pacific, in an address before the Minnesota Federation of Commercial Clubs, at St. Paul, Minn., on January 26, used the following illustration to show up the absurdities in some recent legislation for the regulation of railways.

Let us suppose that some men are engaged in the business of hauling freight of all kinds from the river front in St. Paul to the higher parts of the city. The owners and chief managers are doing the best they can to deliver coal, merchandise and other

freight promptly and cheaply, though every pound must be hauled with difficulty over slippery streets and up heavy grades.

Suddenly, however, a large number of men appear and begin to tell the owners and managers how to run their business. None of these men have any financial interest in the business of transporting merchandise by wagon, and few of them have any practical knowledge of it. One man says, "I have been looking at your wagons and their beds are not the right height from the ground, and you must change them. I notice also that the steps are put on wrong and the buckles of your harness are not of the right character. You must fix these things." Another man says, "The lanterns your teamsters carry are not suitable. You must buy a much more expensive kind and see that they are carried whether they are needed or not." Another says, "You must not use a certain lead horse any more because he is not suited to the business." Another says, "I noticed that you were carrying a calf on one of your wagons. In such cases you must get your wagon from the river front to destination within one hour, and it must be moved at a speed of not less than ten miles an hour." Another says, "In our part of the city your wagons must not move faster than four miles an hour, and you must stop them at every street crossing." Another says, "The city authorities have decided that you must reduce all your charges 25 per cent." And still another says, "I represent a committee that has decided that your sheds and barns are not of the right type and you must tear them down and build new ones."

Meanwhile some of the stablemen and others have come to the managers and owners saying that they have decided not to do any more work unless their pay is increased 25 per cent.

Naturally the owners and their managers are somewhat confused and discouraged at all this interference, and are tempted to say, as the fiddler did in the mining camp, "Please do not shoot, for I am doing the best I can." Now, all this sounds rather ridiculous when it is applied to the man hauling coal and merchandise in the city, but it is exactly what is going on all the time in the United States today in relation to the railways, only there is much more of it because the federal government and all of the states are making rules and regulations about the kind of equipment to be used, the character of locomotive headlight, the kind of boiler in the engine, the speed of livestock trains, the speed of trains in cities, the rates to be charged, the kind of buildings to be put up—and the labor unions are at the same time making demands for increases in pay.

Hudson River Bridge Studies.

The New York and New Jersey Interstate Commission, in its fourth report, just issued, says that a center pier for a bridge over the Hudson is out of the question, and that if ever a bridge is built across the North River at New York it will have to be a single span bridge. This commission (on the part of New York) which consists of McDougall Hawkes, E. W. Bloomingdale, A. J. Shamberg, George R. Dyer and Kingsley L. Martin, serving without compensation, was appointed in 1907 and reports annually to the New York Legislature. Test borings have been made opposite West 179th street and West 110th street, respectively. The commission favored a two-span bridge at the 179th street or 110th street location, but the borings proved that there is no satisfactory foundation for a bridge pier in the center of the river. As there is a width of about 2,800 feet between the established pier head lines along the entire length where a bridge is contemplated the commission was advised by its engineer, Henry W. Hodge, that the construction of such a bridge will cost about the same at any of the proposed sites; and the commission now believes that a bridge located in the West 57th-59th street district will best meet interstate traffic requirements. This opinion is unanimously concurred in by the New Jersey Commission.

On the question of a bridge as against a tunnel for vehicular traffic the report sets forth the reasons for a bridge against any tunnel system.

"Most people," the commissioners say, "have in mind the tunnels now built for railway transportation, which are giving satisfactory and efficient service, but it must be remembered that a tunnel for vehicular traffic is a very different proposition. The railway tunnel does not come to the surface, since the passengers descend to it by stairways and elevators, but vehicles must enter a tunnel by an incline, on which the grades should not exceed 3 per cent. if any heavy hauling is to be considered, and

these inclined approaches make the total length of structure very much longer than the actual river tunnel. This would make necessary a total length of over two miles.

"A powerful plant would be necessary, ready at all times to take care of a heavy rainfall, which might at any time rush in through the long open cuts at either end.

"The ventilation of such a tunnel would be very difficult, as it would be a more serious problem than for a railway tunnel where the trains practically fit the entire bore and thus change the air with each passage. A tunnel would also require a considerable lighting plant, and, finally, not less than six tubes would, in the engineer's opinion, be required to match the capacity of a bridge having four lines of subway or trolley tracks and a driveway wide enough for four lines of vehicles, besides two sidewalks.

"According to the engineers the cost of tunnels of equal capacity would be about the same as a bridge.

"For these reasons, as well as for the general reason that vehicular traffic in the open is in every way more desirable than an artificially lighted, ventilated and drained tunnel, the commission is of the opinion that tunnels cannot from any point of view serve the purpose."

It is estimated that a bridge 2,800 ft. long would cost \$21,000,000.

Proposed Steamship Docks at Montauk.

The Long Island Railroad has bought at Montauk, L. I., a tract of land 160 acres in extent, which, with 60 acres already owned, affords a site for a railway terminal on a deep water front; and plans have been made for piers 1,000 ft. long and 125 ft. wide, a size that will accommodate the largest ocean steamers. Montauk is the eastern terminus of the Montauk division of the Long Island road, and the present action seems to be part of a general purpose to provide at this place an ocean terminal which will enable steamers from Europe to put their passengers and mails into New York City much earlier than is now possible. Montauk is 118 miles east of New York, a distance which can be traversed by passenger and mail trains in two hours and a half; while the steamships, by landing at Montauk, not only will shorten their voyage by the distance named, but also will avoid the inconvenience and delays which are encountered in New York Bay and in getting to their docks. It is understood that the officers of the Long Island road have recently been in consultation with government officers at Washington concerning those features of the proposed improvement which would require action or consent of the government, and it is given out that the road intends to provide itself with an ocean terminus as soon as it shall be needed; but nothing is said as to when work will be begun on the docks, and the steamship companies will not say that as yet they have decided to send boats to the new terminal. Within a few months the White Star Line will have in service one of its new vessels about 100 ft. longer than the *Mauretania*, and there is at present no dock in New York long enough to accommodate such a monster. Application has been made for authority to lengthen the Chelsea piers, on the North river, and until some decision is reached on this point the steamship companies apparently will remain non-committal. A representative of the Long Island road says that the White Star, the Cunard and the Scandinavian steamship lines have inspected the proposed location and have favored the proposed improvement.

Chicago Subways.

Bion J. Arnold, chief subway engineer of Chicago, submitted two plans for subway systems to the mayor and local transportation committee of the city council on Monday, February 6. The first plan contemplates a comprehensive system of two level subways eventually reaching all parts of the city, but to be constructed in five steps as the demands warrant. The first step will provide relief for the congestion of surface cars in the downtown district by the construction of a subway a little more than 2 miles in length. The second and third steps will include the construction of a 4-track subway through the loop district for the accommodation of the elevated railways. The fourth step is for the connection of all the steam railway terminals by subways, while the fifth step provides for extensions into the outlying parts of the city.

The second plan is designed exclusively for the relief of the present congestion of surface cars in the business district.

The total estimated cost of the first plan is \$54,450,000, but expenditures of \$2,500,000 to \$3,000,000 will be all that is necessary to start with the first step. The estimated cost of the second plan is between \$4,500,000 and \$4,750,000, with an additional outlay of \$2,950,000 for the necessary connections for universal through routing.

Mr. Arnold recommends the first plan because of the necessity of starting with but a small investment but providing for expansion as the demands warrant, although the second plan is so arranged that it will not conflict with the construction of the first plan at a later date. There will be no grade crossings, and there will be high speed, straight line operations. Engineer Arnold recommended the use of reinforced concrete, with steel construction where the stations occur, as the cheapest and best.

Passage of Boiler Inspection Bill.

The lower house of Congress on Tuesday of this week passed the bill providing for federal supervision of the inspection of locomotive boilers, which passed the Senate on January 10. This bill provides for a chief inspector, two assistant inspectors and 50 district inspectors, with authority similar to that now exercised by the Public Service Commission in the state of New York. The substance of its provisions was given in the *Railway Age Gazette* of January 20, page 126. See editorial columns.

Degrees Conferred at Lincoln.

The University of Nebraska has conferred the degree of Doctor of Engineering on three engineers of prominence, one each in bridge design, electricity and mechanics. They are J. A. L. Waddell, senior member of the firm of Waddell & Harrington, Kansas City; Bion J. Arnold of Chicago; and Mortimer E. Cooley, dean of the Engineering Schools of the University of Michigan.

Mr. Acworth's Observations.

W. M. Acworth, of London, who has been in this country for the last two months and who has been to Texas and other western states, spoke as follows on his departure for home last week:

"The principal defect of American railway management lies in the centralization of administrative power in headquarters in Chicago and New York. This, while tending, doubtless, to efficiency and economy, is responsible in some degree for the present strained relations between the railways and the public. Matters that arise in Kansas, in Texas, in the far South, in the far West and need prompt adjustment have to be referred to officers a thousand miles or two thousand miles away, and the citizen thinks he is dealing with a machine.

"In those important sections of your country the large railway system should have real executive officers with the largest possible discretion to deal with local questions on the spot. The ranking officers of your railways should every now and then visit the different communities along their lines and cultivate the personal acquaintance of their citizens.

"The skeletons in the railway cupboard have all been buried, and the roads would do well to open their cupboards and let the public see how sweet and clean they are.

"In actual economy of railway operation the Americans are first in the world. Why do the newspapers give so much space to criticism of railway efficiency? In the number of tons per car and cars per train, in the fullest utilization of locomotives, in obtaining the greatest measure of result for each unit of expenditure, they are not equalled by the railways of any other nation.

"The investors of Europe and even your own Wall Street seem hardly to grasp the enormous amount of money that must be spent upon your railways to keep pace with your growing traffic. If your traffic doubles every ten years, as it substantially does, you will need not perhaps to double your facilities every ten years, but to increase them at least 50 per cent. The eleven hundred millions per year specified by Mr. Hill as necessary for this purpose is none too much. The inhabitants of your Western and Southern states, your people in general, must

understand that this capital cannot be obtained in their own communities.

"Texas and Oklahoma have no money to spare for railway building. They want it all for their own local business. Even the East cannot find all the money required. This money in large measure must for a long time to come be raised abroad; and investors in other lines will not be willing to subscribe it so long as there is a continuance of the harassing conditions which tend to impair the revenues of your railways, to hamper their administration and to retard their development. If the railways of the United States could reach a time when state legislators ceased from troubling and state commissioners were at rest it would be good for the railways and still better for the citizens of the United States.

"No one would say that American farmers are more efficient than those of France and England or that your government is more efficient than the government of Prussia. Your railways have reached a higher standard in international comparison than your farmers or your government, and under greater difficulties, for in England and on the continent employment with a railway company is a prize and every man hopes to remain in the service of the same company throughout his life. He is, therefore, obviously more amenable to discipline than the shifting, and often even foreign force employed on your railways."

Railways in Southern Asia.

In their more far-reaching connections and results, the railway enterprises of South China are even more important than those of North China. The work now being done or likely to be done in the general railway development of this portion of the Chinese Empire is under the control of French and British interests, the French by reason of the railway connections to be made with Indo-China through the Province of Yunnan, and the British through the connections possible by way of Burma. French and British interests have the surrounding country so well under control in the way of railway construction that when concessions are granted foreigners for the construction of lines in Chinese territory, they will, perforce, go to those controlling the connections to be made. What part these railways are to have in the development of Asia can readily be understood after reading the following article from the *National Review*, a Chinese-British publication: Yunnan, which is about half the area of France, but with only about one-eighth of France's population, owes its present-day prominence to its geographical position in relation to the spread of railways in southeastern Asia. The northwestern boundary of Yunnan touches Tibet, thence it goes south and fringes Assam, Burma, Siam and Tongking. Across Yunnan are the shortest land routes between the British and French Indies and China. The route from Canton to Calcutta, via Yunnan, is 1,600 miles, compared with 4,000 miles by sea through the Straits of Malacca. To take a longer view, the Yunnan lines will form an important section on the great trunk railway now assuming shape across southern Asia, which will link Canton with the European system at Constantinople, and with that of Africa at Cairo. Of this great trunk railway, fully 5,000 miles in length, about 3,500 miles are either already in operation or under construction; and the greater part of the remainder of the distance has been surveyed and projected. The main line of this route, as at present existing, runs from Karachi, on the Arabian Sea, across northern India to Assam. From that point it forks into two branches, both of which impinge upon Yunnan. The more northerly branch reaches Sadiya, on the border where Tibet, China, and Burma meet, at the point where the Brahmaputra, descending from the heights of Tibet, turns sharply in its course to roll onward through the plains of Bengal. This Sadiya branch is meantime of importance because of the coal fields to which it gives access, and its continuance into Yunnan would create a connection between the Brahmaputra and the upper navigable waters of China's great river, the Yangtze Kiang—from which Sadiya is less than 400 miles distant—but the other branch referred to is more likely to form the main route through Yunnan to the east. It leaves the existing line about 150 miles north of Mandalay and runs to Bhamo on the Chinese frontier. From Bhamo, or from Kun-lon, on the same frontier, to which a third branch runs from Mandalay, the British government has the right to extend the lines through Yunnan and to the Yangtze Kiang. The only railway actually tapping the province of Yun-

nan, across which all the immensely important connections noted must be made, is the French line, opened to traffic on April 1 last, from Haiphong on the Gulf of Tonkin to Hanoi, thence to Lao Kai on the Chinese frontier and on to Yunnan-fu, the capital of the province, a distance of about 450 miles from the starting point. Yunnan-fu is likely to be the junction point for all of the lines across south Asia.—*Consular Report.*

American Institute of Consulting Engineers.

At the annual meeting of the American Institute of Consulting Engineers, held on January 17 in New York, the following officers were elected for the ensuing year: President, Alfred P. Boller; vice-president, Gustav Lindenthal; secretary and treasurer, Eugene W. Stearn, 103 Park avenue, New York. The members of the council are as follows: For the term expiring January, 1912, Gustav Lindenthal, New York; Ralph Modjeski, Chicago; and John F. Wallace, New York. For the term expiring January, 1913, General T. A. Bingham, New York; Rudolph Hering, New York; and C. O. Mailloux, New York. For the term expiring January, 1914, Alfred P. Boller, New York; J. F. Greiner, Baltimore, Md.; and C. C. Schneider, Philadelphia, Pa. The following standing committees were appointed: Committee on admissions, Gustav Lindenthal, chairman; C. O. Mailloux; Rudolph Hering; J. E. Greiner and R. P. Bolton. Committee on professional practice and ethics, John F. Wallace, chairman; H. W. Hodge, L. B. Stillwell, F. A. Molitor, G. F. Swain and W. J. Wilgus. Committee on legislation, Gen. T. A. Bingham, chairman; S. O. Miller and S. Whinery.

The institute is the outgrowth of a local association of consulting engineers, organized in New York in 1905, now expanded into one of national scope. At a meeting held last December, the constitution was amended and the name, originally the Association of Consulting Engineers, was changed to the present one. The main object of the institute is to promote the business interests of the consulting engineer by advocating a code of ethics, professional practice and schedule of charges, by acting in pertinent legislative matters, and by urging the separation of the contractor from the designing engineer. The membership is limited to those actively engaged in the independent practice of the profession of engineering, in any of its branches, as consulting engineers, and who are not engaged in contracting.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual convention, May 23-26, Chicago.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911; Niagara Falls, N. Y.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., 1911.
- AMERICAN ASSOCIATION OF LOCAL FREIGHT AGENTS.—G. W. Dennison, Pennsylvania Co., Toledo, Ohio.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 17-19, 1911; St. Louis, Mo.
- AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—E. H. Fritch, Monadnock building, Chicago; March 21-23, 1911, Chicago.
- AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911; Detroit, Mich.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except June and August; New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; 3d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; semi-annual, June, Washington, D. C.; annual, November, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston, Mass.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug.; Montreal.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal.
- CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; annual, October 9, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y.
- CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug.; St. Paul.
- ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; June 21, St. Paul, Minn.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago; annual, July 29, Chicago.
- INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C. H. & D., Indianapolis, Ind.
- INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911; Chattanooga, Tenn.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn. Next convention July 25-27, Chicago.
- INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
- INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.
- IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
- MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; Sept. 12-15, 1911, Atlantic City, N. J.
- NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.
- NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
- NORTHERN RAILWAY CLUB.—C. L. Kennedy, C. M. & St. P.; 4th Saturday; Richmond, Va.; 20th annual, June 21, 1911, St. Paul, Minn.
- OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Bldg.; second Wed.
- RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo., 3d Friday in month; Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; March 20, Chicago; annual, Oct. 10, Colorado Springs, Colo.
- RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911; Milwaukee, Wis.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis; annual, Oct. 20, Atlanta.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.; semi-annual, April 20, Atlanta, Ga.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs.; Jan., April, August and Nov.; Atlanta.
- TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday; annual, May 6, 1911; Toledo.
- TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
- TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly; Pittsburgh.
- TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore, Md.
- TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 11, 1911.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, August, 1911, Chicago.
- WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; annual, May 8, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
- WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August; Chicago.
- WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago.

Traffic News.

The Missouri house has passed a bill to prohibit railways from charging a higher passenger rate per mile between any stations on their lines than they charge between competitive points.

A bill has been introduced in the New York legislature to empower the public service commissions to suspend tariffs, a power similar to that exercised by the Interstate Commerce Commission.

The state railway commission of Florida has complained to the Interstate Commerce Commission against the rates on fruits and vegetables charged by the Seaboard Air Line from points in Florida to places in other states.

The Agriculturist of the Lehigh Valley Railroad, assisted by other agriculturists from the New York State Experiment Station and Cornell College, last Wednesday, at Burdett, near the east shore of Seneca Lake, gave a lecture to the fruit growers of New York state. Similar talks are to be given at other places along the line.

The order of the California State Railroad Commission, made December 24, reducing freight rates from Los Angeles to the San Joaquin valley, goes into effect February 15; the petition of San Francisco merchants for a reopening of the case having been denied last week. The order applies to all classes of freight, and following are examples of the reductions on the highest and lowest classes (class 1 and class E); to Bakersfield, 71 cents to 67 and 22.5 cents to 17; to Visalia, 79 to 71 and 29 to 19; to Fresno 80 to 79 and 30 to 21.

The Transcontinental Passenger Association lines have decided to make reduced rates for the convention of the National Educational Association, which will be held in San Francisco, July 8 to 14. It is probable the fare from Chicago will be \$62.50 for the round trip. A reduced rate will also be made for conventions in other California cities, the probable rate for other conventions being \$72.50. A one-way rate of \$33 from Chicago and \$32 from St. Louis to the Pacific coast, effective March 10 to April 10, will be made.

Traffic Manager Langdon of the Long Island Railroad has issued a pamphlet showing the number of buildings put up on Long Island during the last calendar year, part of a record which he has kept for the past six years. The total for 1910 is 8,517, which is 848 more than were built in the year 1909. The present record includes 7,068 dwellings, 803 stores, 42 factories and 604 miscellaneous buildings. The records are gathered by the local agents and other representatives of the company, and the list shows the number in about 150 places. It has been found that the gross receipts of the railway increase at the rate of \$100 a year for each new building. For example, the number of buildings put up in six years has been 37,086. The earnings six years ago were \$7,824,000. Adding to this \$3,708,600, we have \$11,532,600, which is only about \$62,000 less than the actual gross receipts for 1910.

Special Examiner Burchmore of the Interstate Commerce Commission took testimony at Chicago last week in the case involving the action of the railways in cancelling certain L. C. L. commodity rates between Illinois and Wisconsin points. The witnesses who testified for the railways were F. P. Eyman, assistant freight traffic manager of the North Western; H. A. Pierpont, general freight agent of the St. Paul; M. A. Patterson, assistant general freight agent of the Rock Island, and F. S. Hollands, assistant general freight agent of the Chicago Great Western. It was shown that the rates in question had originally been established to enable industries located in the interior to ship into Chicago and Milwaukee for redistribution; that they are anomalous; that they are all for short hauls, the average being about 50 miles, and that increased terminal costs have made the handling of traffic much more expensive than when the rates were made. It was insisted that the advances would not hurt anybody, as the industries that pay the rates have grown strong enough to stand the advances.

Arthur Hale at Cincinnati Traffic Club.

In an address before the Traffic Club of Cincinnati on February 6, Arthur Hale, general agent of the American Railway

Association, said, in part, that while the advantages of co-operation had been illustrated ever since two men had acted together with a common aim, he felt that the traffic clubs were the last and probably the most important indications of the advantages of co-operation, involving as they did the largest business elements in the country—the shippers and the transportation companies. He was therefore glad to see the number of traffic clubs increase. He felt that every traffic club had had a large part in every recent improvement in understanding, such improvement being made more and more essential by the progress of the law in the regulation of transportation companies and of shippers.

The traffic clubs of the country have helped in one marked advance, viz., the increase of car efficiency of the railways in the last four years. In the fall of 1906 there was the most serious car shortage of which we know. We have no accurate record of how serious that car shortage was, nor how serious had been the prior car shortages; but it was certain that such a car shortage would never occur again, and that on account of co-operation between the railways and the shipping public.

After Mr. Brandeis' arraignment of the railways he could hardly hope that anyone could think that any action of theirs was scientific. Even if it was not scientific he felt that Mr. Brandeis would agree that it was beneficial. Whether scientific or not, the result of the action, which he felt was joint action on the part of the railways and the shipping public, was when in the fall of 1910 more freight was moved than four years before, there was no serious car shortage, although the two years preceding had been years of very hard times for the railways.

The reason that there was no serious car shortage last fall was because there were more cars and better cars furnished by the railways, and these cars were loaded more fully and handled more promptly by the shipping public. He had no doubt that the traffic clubs of the country in bringing the shipping public and the railways together had contributed to this result, but that there were more definite causes than this and causes which the traffic clubs had undoubtedly done their best to foster. . . . During the car shortages of the fall of 1906 the railways had taken such steps that since that time they have always known exactly what the shortage and surpluses are, and furthermore they have shared that knowledge with the shippers and given them due notice whenever anything like a car shortage seemed imminent. In addition, the railways have used the experience which these car shortage statements recorded and have increased their equipment as they thought would be necessary to meet impending emergencies, and although the emergencies had exceeded those of 1906 and 1907 they had been successfully met. On the other hand, the public, working through the State and Interstate Commissions, and through the demurrage rules, had succeeded in reducing the detention of cars by shippers and consignees, and in thus doing had borne its part in the great reform.

Traffic Club of New York.

The Traffic Club of New York held its fifth annual dinner last Saturday evening at the Waldorf-Astoria, with about 600 members and guests present. The speakers were: Judge Thomas J. Freeman, receiver and general manager of the International & Great Northern; William A. Glasgow, Jr., a Philadelphia lawyer, and J. Adam Bede, of Minnesota, formerly member of Congress. Governor John A. Dix, of New York, had been invited, but was unable to be present and sent a telegram expressing his regrets. He said in part: "I have an interest in all that pertains to transportation. Emerson [R. W., not H.—Ed.] said that there was 'meanness in traffic,' I presume that he had reference to freight rates, or possibly to obtaining a satisfactory rate in moving the commodities for which he was responsible. Every producer of a commodity lives in the hope that rates will be reduced, but that imposes on the producer the responsibility of giving to the traffic manager a greater [volume of] product. You thus work with those who create, and you aid in the development of communities by serving them best and receiving from them in return their best. I trust that you will live forever. . . ."

Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting

statistical bulletin No 90, covering car balance and performance for October, 1910, says:

"The averages reported in the bulletin reflect a typical October performance, which indicates conditions strikingly similar to those existing in October, 1907. Following is a comparison of the principal averages for the past four years.

	October, 1910.	October, 1909.	October, 1908.	October, 1907.
Gross revenue per mile of road.....	\$1,092	\$1,100	\$1,002	\$1,104
Per cent. home cars on line.....	57	61	69	58
Average miles per day.....	24.8	25.6	23.8	24.8
Per cent. loaded mileage.....	71.6	73.4	70.7	72.9
Ton miles per car per day.....	376	379	346	382
Average daily earnings all cars on line..	2.66	2.70	2.33	2.67

"It will be noted that miles per car per day averaged the same in both 1907 and 1910, while there is but one point difference in the per cent. of home cars on line, and the average daily earnings per car on line.

"Compared with September averages, the performance shows an improvement in all items excepting tonnage per car and per loaded car, which decreased from—

	Tons per Car.	Tons per Ld. Car.
September, 1910.....	15.5	21.6
October, 1910.....	15.4	21.5

"The ton miles per car per day, however, increased from 375 to 376, reflecting the increased daily mileage of cars. The daily earnings per car on line increased from \$2.59 to \$2.66." The accompanying table gives car balance and performance in October, and the charts on the facing page show car earnings and performance in 1907, 1908, 1909 and 1910.

INTERSTATE COMMERCE COMMISSION.

The commission has suspended until June first, certain tariffs naming increased rates on rice and rice products, filed by the agent of the Southern Pacific and the Mallory Steamship Company. Sixty-four other carriers are named as defendants.

Refusal to Order Through Rate.

Edison Portland Cement Company v. D. L. & W. Opinion by Commissioner Prouty:

The commission is unable to declare defendants guilty of negligence in not having established through routes for Portland cement from New Village, N. J., to Williamstown and Enosburg Falls, Vt. The road finally succeeded in establishing joint rates, and we cannot say that it was guilty of negligence in not having been able to bring about this arrangement at the time of the movement in question. (20 I. C. C. 95.)

Beekman Lumber Company v. Illinois Central.

Proportional rate of 11 cents on lumber, Winfield, Ala., to Thebes, Ill., restricted in its application to shipments destined beyond Thebes, held inapplicable when the only destination indicated on the bill of lading was Thebes proper. Combination rate of 23½ cents assessed for the movement of a car of lumber as from point of origin to Thebes proper found unreasonable and lower rate prescribed for future. Reparation awarded. (20 I. C. C. 98.)

Rates on Cream Reduced.

R. E. Cobb et al. v. Northern Pacific et al. Opinion by Commissioner Prouty:

Complainants are engaged in the operation of creameries at Minneapolis and St. Paul and using the centralizer method. The commission orders the adoption of the distance rates prescribed in the *Beatrice case* (15 I. C. C. Rep., 109) over the lines of the defendants between interstate points within a distance of 510 miles from St. Paul. It is highly desirable that there should be uniformity in all this territory when that can be attained without any sacrifice of justice. There ought always to be harmony between state and interstate transportation by rail; but under the circumstances of this case this commission feels that it can not deny the prayer of complainants. These centralizers are engaged in the manufacture of butter at St. Paul, in the course of which they draw their supplies from points without the state of Minnesota, and they also sell their product at points without that state. The very purpose of this commission is to see that persons requiring interstate transportation shall be accorded

CAR BALANCE AND PERFORMANCE IN OCTOBER, 1910.												
New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.	
Revenue freight cars owned.....	79,892	703,815	218,533	177,409	159,867	388,439	17,405	128,436	27,505	139,040	104,211	2,144,552
Average number of system cars on line.....	39,504	387,740	124,471	93,160	78,586	264,212	6,016	68,420	16,187	65,715	69,593	1,213,604
Railway-owned cars: Average foreign on line....	45,646	297,087	100,738	63,089	57,865	164,879	14,640	61,000	22,804	64,585	33,539	925,872
Total Railway-owned cars on line.....	85,150	684,827	225,209	156,249	136,451	429,091	20,656	129,420	38,991	103,132	2,139,476	.....
Excess	5,258	.....	6,676	.....	.....	40,652	3,251	984	11,486	.....	.....	.....
Per cent. of cars on line to total owned:	49	55	57	53	49	68	35	53	59	67	57	.....
Home	57	42	46	35	36	42	84	47	47	32	43	.....
Foreign .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All railways	106	97	103	88	85	110	119	100	141	99	100	.....
Private cars on line.....	3,277	39,881	12,000	2,554	5,896	17,912	2,663	8,876	2,953	9,988	108,324	.....
Total, all cars on line.....	88,427	724,708	237,209	158,803	142,347	447,003	23,319	138,296	41,944	140,288	2,247,800	.....
Per cent. of cars in shop.....	5.03	5.29	8.46	7.32	8.87	5.23	4.16	8.54	5.36	5.86	6.23	.....
No. of freight engines owned.....	1,155	10,320	2,940	3,018	2,450	6,270	495	2,573	716	2,577	34,670	.....
Average cars on line per freight engine owned...	77	70	81	53	58	71	47	54	59	54	65	.....
Total freight-car mileage.....	45,926,858	538,213,522	163,636,100	120,718,759	118,261,495	342,697,771	33,094,277	9,177,726	36,691,746	133,411,731	1,725,260,033	.....
Average miles per car per day.....	16.8	24.0	22.3	24.5	26.8	24.7	45.8	22.6	28.2	30.7	24.8	.....
Per cent. loaded mileage.....	71.9	69.6	71.3	69.6	74.5	73.4	74.2	71.5	63.6	73.3	76.4	.....
Ton-miles of freight, including company freight..	532,443,277	8,452,205,433	2,609,809,035	1,957,713,496	1,743,566,004	2,943,870,195	472,105,517	1,310,090,335	307,724,479	1,965,678,737	23,764,708,587	.....
Average ton-miles, including company freight:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Per car-mile	11.6	16.6	16.7	16.2	14.8	14.2	14.9	14.3	11.4	14.9	15.4	.....
Per loaded car-mile	16.1	23.8	23.2	23.3	18.7	19.7	20.1	19.5	15.9	20.4	21.5	.....
Per car per day.....	194	400	374	398	399	298	720	323	325	459	450	.....
Gross freight earnings.....	\$6,250,633	\$52,630,337	\$15,104,067	\$12,302,546	\$11,992,896	\$36,016,823	\$4,089,044	\$12,199,653	\$4,406,812	\$20,137,408	\$185,369,882	.....
Average daily earnings: Per car owned.....	\$2.53	\$2.41	\$2.22	\$2.24	\$2.42	\$2.99	\$7.58	\$3.06	\$5.17	\$4.67	\$3.17	.....
Per railway car on line.....	2.37	2.48	2.16	2.54	2.84	2.71	6.39	3.04	3.65	4.99	3.20	.....
All cars on line.....	2.28	2.34	2.05	2.91	2.72	2.60	5.65	2.85	3.39	4.63	3.13	.....

just and reasonable charges for that service; and it has no right to respect the policy of the state of Minnesota nor of the state of North Dakota if they interfere with the application of a just and reasonable transportation charge for this interstate service. These states have made rates to favor the local creameries. (20 I. C. C. 100.)

STATE COMMISSIONS.

The Iowa Commission has been reorganized with Nathaniel S. Ketchum as chairman.

C. M. Larson, real estate engineer of the Chicago & Alton at Chicago, has been appointed principal assistant engineer of the Wisconsin railway commission.

The South Dakota railway commission has issued an order requiring the railways to put intrastate class rates west of the Missouri river, except in the Black Hills, on the same basis that is now in effect east of the Missouri river. This will involve a substantial reduction.

W. M. Barrow, formerly secretary of the Louisiana railway commission, has been appointed assistant attorney-general of Louisiana. His office will be at Baton Rouge, and one of his duties will be to assist shippers in the preparation and presentation of cases before the commission.

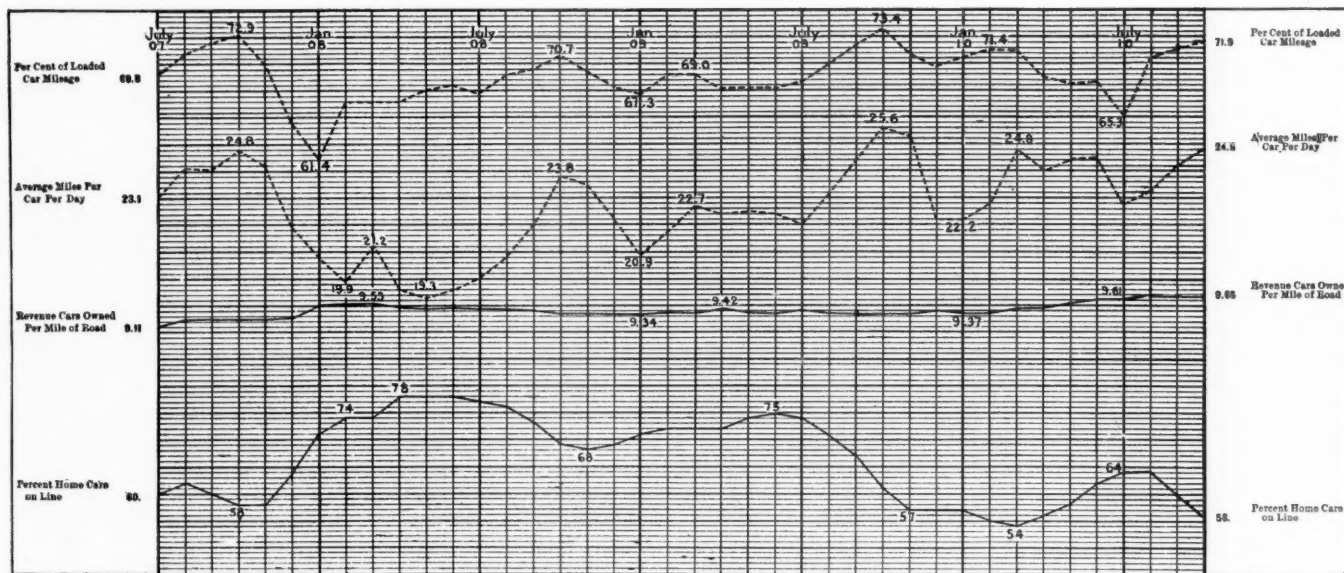
Prof. Milton J. Brecht, superintendent of public schools of Lancaster county, has been appointed by the governor of Pennsylvania a member of the state railway commission, succeeding John Y. Boyd. The term is five years. Prof. Brecht has been a school teacher and politician all his life, and is 56 years old. He has twice been a candidate for Congress, but has not been active in politics for the past six years.

COURT NEWS.

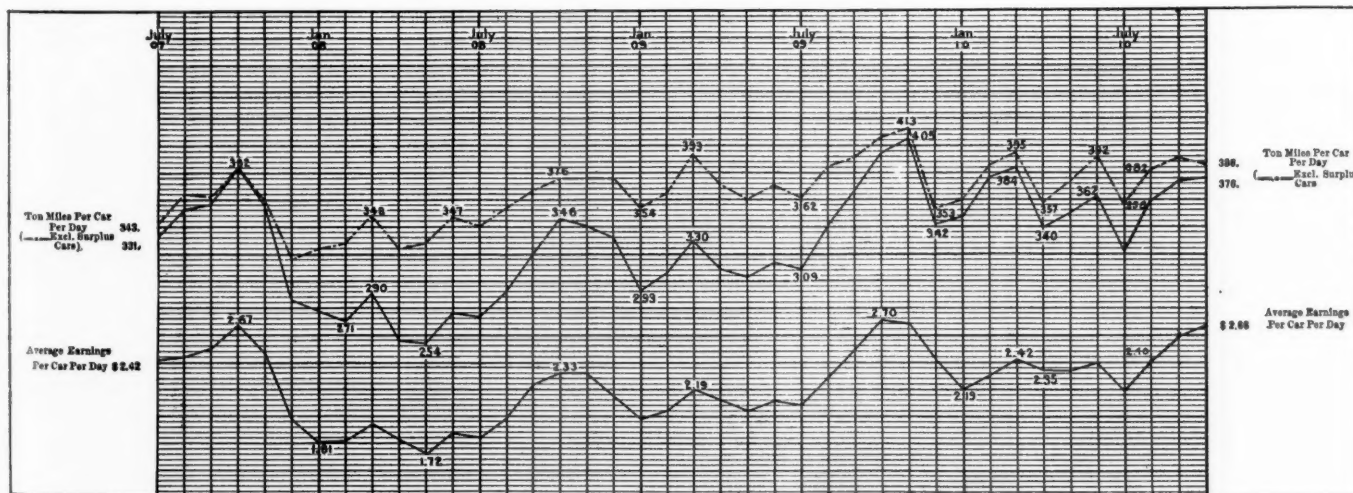
Judge McPherson of the United States district court at Des Moines, Iowa, has enjoined the Iowa railway commission from reducing rates on soft lumber and nut coal.

In the federal court at New Orleans, February 2, the Texas & Pacific was fined \$100 each on five counts of an indictment charging the collection of illegal rates for storage. Counsel for the road said that the practice declared illegal was common on all of the roads in the territory affected and that the suit against the Texas & Pacific was a test case.

The federal court at Portland, Ore., has refused to restrain the Oregon railway commission from enforcing an order requiring reductions in class rates between Portland and southern Oregon points, and the reduced rates went into effect on January 27. Judge Wolverton, who rendered the opinion, held that it did not appear that the railway will necessarily be deprived of its property or of a fair remuneration on its investment.



Car Performance in 1907, 1908, 1909 and 1910.



Car Loading and Earnings in 1907, 1908, 1909 and 1910.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

T. S. Williams, vice-president of the Brooklyn Rapid Transit, has been elected president, succeeding E. W. Winter, resigned.

George W. Peterson has been appointed a general attorney of the Chicago, St. Paul, Minneapolis & Omaha, with office at St. Paul, Minn.

Charles D. Warren, president of the Traders' Bank of Toronto, Can., has been elected president of the New Orleans, Fort Jackson & Grand Isle, succeeding A. Kennedy.

Mark W. Potter, chairman of the board of the Carolina, Clinchfield & Ohio, with office at New York, has been elected president, succeeding George L. Carter, resigned.

D. H. Dunham has been appointed assistant attorney of the Chicago & North Western, with office at Omaha, Neb., succeeding C. C. Wright, promoted to general solicitor at Chicago.

The officers of the Kettle River Valley are as follows: James J. Warren, president, Vancouver, B. C.; F. M. Holland, vice-president, Toronto, Ont.; C. B. Gordon, secretary and treasurer, Vancouver, B. C., and O. E. Fisher, auditor and general freight and passenger agent, with office at Republic, Wash.

H. E. Graham, superintendent and general freight agent of the Pittsburgh, Allegheny & McKee's Rocks, at Pittsburgh, Pa., has been elected vice-president and manager; A. G. Davis has been appointed secretary and auditor, and F. M. Garland has been appointed treasurer, all with offices at McKee's Rocks.

E. F. Blomeyer has been elected vice-president and general manager of the Tennessee, Alabama & Georgia (formerly the Chattanooga Southern), with office at Chattanooga, Tenn. I. M. Dittenhoefer has been appointed general solicitor, with office at New York, and Coleman & Frierson, general counsel, with office at Chattanooga, Tenn.

Operating Officers.

F. Demuth has been appointed superintendent of the Grand Forks division of the Kettle River Valley, with office at Grand Forks, B. C.

Abner Bernard has been appointed trainmaster of freight terminals of the Illinois Central, with office at Fordham, Ill., succeeding Daniel J. Higgins, assigned to other duties.

W. J. Tally has been appointed superintendent of transportation of the Raleigh & Southport, with office at Raleigh, N. C., succeeding T. F. Wilson, who has resigned to go to another company.

W. M. Wardrop, trainmaster of the Pennsylvania Lines West at New Castle, Pa., has been appointed superintendent of the Western division, with office at Fort Wayne, Ind., succeeding J. B. McKim, assigned to other duties.

J. S. Stevens, superintendent of telegraph of the Chesapeake & Ohio, at Richmond, Va., having been granted leave of absence on account of ill health, C. W. Bradley has been appointed acting superintendent of telegraph, with office at Richmond.

Theodore Ensle, superintendent of the Pere Marquette, at Grand Rapids, Mich., has been appointed superintendent of telegraph, with office at Detroit, succeeding W. K. Tasker. J. S. Pyeatt, superintendent at Detroit, succeeds Mr. Ensle, and W. K. Tasker succeeds Mr. Pyeatt.

C. A. Morgan, assistant trainmaster of the Delaware & Hudson, at Carbondale, Pa., has been appointed trainmaster, succeeding J. H. Rosenstock, promoted. J. J. Rounds, day chief despatcher, at Carbondale, succeeds Mr. Morgan. E. G. Knapp, night chief despatcher, at Carbondale, succeeds Mr. Rounds, and P. F. Kilker succeeds Mr. Knapp.

A. Q. Campbell, assistant engineer of the Oregon Short Line at Ogden, Utah, has been appointed an assistant superintendent on the Idaho division, with office at Pocatello, Idaho, succeeding W. S. Harer, resigned. C. F. Smith has been appointed an assistant superintendent on the Idaho division, with office at

Nampa, Idaho, succeeding T. W. Rickard, assigned to other duties.

In the absence of J. P. O'Brien, general manager of the Oregon-Washington Railroad & Navigation Company at Portland, Ore., M. J. Buckley, assistant general manager, will be in charge of operation of the road. J. D. Stack, also assistant general manager at Portland, will assume the duties devolving on Mr. Buckley, and L. R. Fields, superintendent at Portland, with the title of acting assistant general manager, will temporarily succeed Mr. Stack.

Ira A. McCormack has been appointed assistant general superintendent of the Eastern district of the New York Central & Hudson River, with office at New York. Mr. McCormack was



Ira A. McCormack.

born in 1859, and began railway work in 1872 as a telegraph operator on the Pittsburg & Connellsville, now a part of the Baltimore & Ohio, and the following year he went to the Pittsburgh, Fort Wayne & Chicago, now a part of the Pennsylvania Railroad, where he remained for 13 years as brakeman, conductor, freight and ticket agent and yardmaster. His next position was yardmaster on the West Shore, and in 1888 he was promoted to trainmaster. Three years later he went to the Pittsburgh & Lake Erie as trainmaster, at Pittsburgh, but soon after took a similar position

on the New York Central. He then went to Chicago to install automatic signals on the Chicago & North Western and the Illinois Central, and was later trainmaster on the Lake Shore & Michigan Southern. In 1895 he was appointed general superintendent of the Brooklyn Rapid Transit, and in 1899 was elected vice-president of the Syracuse Rapid Transit, leaving that position to become general manager of the Cleveland Electric Street Railway. He returned to the New York Central in 1902, as assistant manager of the Grand Central station and was promoted to the position of manager of the Grand Central station and Harlem Line, which title was changed in 1905 to general superintendent of the electric division. He held this position until 1907. At the time of his recent appointment, Mr. McCormack was a special agent in the transportation department of the New York Central, at New York.

Traffic Officers.

J. F. McDoel, commercial agent of the Chicago, Indianapolis & Louisville, with office at Lafayette, Ind., has retired.

C. H. George has been appointed general freight agent of the Pittsburgh, Allegheny & McKee's Rocks, with office at McKee's Rocks, Pa.

M. W. Ratchford has been elected manager of the Illinois and Iowa Demurrage Bureau, with office at Peoria, Ill., succeeding Ashley J. Elliott, deceased.

Reed Finley, soliciting freight agent of the St. Louis & San Francisco at Dallas, Texas, has been appointed agent of the Mallory Line, with office at Waco, Texas.

R. M. Chastian has been appointed a commercial agent of the St. Louis, Iron Mountain & Southern, with office at Texarkana, Ark., succeeding Fred Van Fossen, resigned.

C. W. Jones, city passenger agent of the Chicago, Rock Island & Pacific at Kansas City, Mo., has been appointed general agent in the passenger department, with office at Kansas City.

J. G. Pullinger, agent of the Western Transit Company, at St. Louis, Mo., has been appointed also agent of the Rutland

Transit Company, with office at St. Louis, succeeding A. A. Poland, resigned.

J. Y. Calahan, general agent of the New York, Chicago & St. Louis, at Chicago, has been appointed an assistant general passenger agent, with office at Chicago, a new position, and his former office has been abolished.

F. D. Hurst has been appointed general agent of the Lake Erie & Western, the Northern Ohio and the Fort Wayne, Cincinnati & Louisville, with office at Pittsburgh, Pa., succeeding B. J. Torbron, promoted.

R. F. Atwood, commercial agent of the Rock Island Lines at St. Joseph, Mo., has been appointed commercial agent, with office at Kansas City, Mo., succeeding Fred Smith, promoted to assistant general freight agent.

A. J. Davidson, formerly president of the St. Louis & San Francisco, has been appointed commissioner of the Pacific Northwest Demurrage Bureau, with office at Seattle, Wash., succeeding Robert Dodgeon, deceased.

E. W. Clapp has been appointed assistant general freight and passenger agent of the Southern Pacific lines in Arizona and New Mexico, also general freight and passenger agent of the Arizona Eastern, with office at Tucson, Ariz., succeeding R. S. Stubbs, assigned to other duties.

H. G. Brewer, soliciting freight agent of the Trinity & Brazos Valley at Waxahachie, Texas, has been appointed a traveling freight agent, with office at Fort Worth, Texas, succeeding D. W. Calloway, resigned to accept service with another company. J. J. Mullane succeeds Mr. Brewer. George Dirmeyer has been appointed a traveling freight agent, with office at Dallas, Texas, succeeding H. S. Fry, resigned to go with the Texas City Steamship Company.

P. A. Auer, whose appointment as assistant general passenger agent of the Rock Island Lines, with office in Chicago, was announced in the *Railway Age Gazette* of January 27, page 185, began railway work in 1887 with the Chicago, Rock Island & Pacific in Chicago as city depot ticket agent. He held this position for twelve years and was then made traveling passenger agent, with office at New York. In 1902 he was promoted to division passenger agent at Pittsburgh, Pa., and two years later was appointed general passenger agent of the Chicago, Rock Island & Gulf, with office at Fort Worth, Texas, from which office he has just been promoted.

William E. Farris, whose appointment as general freight and passenger agent of the Buffalo & Susquehanna, with office at Buffalo, N. Y., has been announced in these columns, was born November 22, 1870, at Sandborn, Ind. He was educated in the common schools, and began railway work August 1, 1891, as a telegraph operator and agent on the Evansville & Terre Haute. Mr. Farris remained in the service of this company at various places until April, 1905, when he was appointed agent in charge of the Evansville & Terre Haute and the Chicago & Eastern Illinois terminals at Terre Haute, Ind. He resigned from that position December 31, 1910, to become assistant general freight and passenger agent of the Buffalo & Susquehanna, which position he held for one month, until his appointment as general freight and passenger agent.

G. S. Pentecost, whose appointment as general passenger agent of the Chicago, Rock Island & Gulf, with office at Fort Worth, Texas, was announced in the *Railway Age Gazette* of January 27, page 185, was born October 12, 1872, at Mt. Vernon, Ind. He graduated from the high school in 1891, and began railway work in 1898 with the Chicago Terminal Transfer Company. He was next a ticket seller at the Grand Central depot, Chicago, and in January, 1902, was made passenger agent of the Chicago, Rock Island & Pacific at Chicago; in August of the same year he was made traveling passenger agent, with office at Fort Worth. He was then promoted consecutively to passenger agent at El Paso, Texas; district passenger agent at Pittsburgh, Pa.; division passenger agent at Omaha, Neb., and assistant general passenger agent at Kansas City, from which last office he has just been promoted.

Engineering and Rolling Stock Officers.

A. McCulloch has been appointed chief engineer of the Kettle River Valley, with office at Merritt, B. C.

V. W. Ellet has been appointed a general foreman of the Rock Island Lines, with office at Rock Island, Ill., succeeding J. E. Loy, assigned to other duties.

G. S. Hunter has been appointed a master mechanic of the Missouri, Oklahoma & Gulf, with office at Muskogee, Okla., succeeding J. F. Grealy, resigned.

J. K. Howard, assistant engineer maintenance of way of the Ann Arbor Railroad, at Owosso, Mich., has been appointed engineer maintenance of way, with office at Owosso, succeeding G. R. Endert, resigned. J. P. Ramsey succeeds Mr. Howard, with office at Owosso.

C. W. Dieman has been appointed master mechanic of the Green Bay & Western, the Kewaunee, Green Bay & Western, the Ahnapee & Western and the Iola & Northern, with office at Green Bay, Wis., succeeding W. P. Raidler, resigned to engage in other business.

G. L. Lambeth, master mechanic of the St. Louis division of the Mobile & Ohio, at Jackson, Tenn., has been appointed master mechanic of the Mobile division, with office at Whistler, Ala., succeeding E. G. Brooks, assigned to other duties. W. Q. Daugherty succeeds Mr. Lambeth.

F. O. Walsh, master mechanic of the Atlanta & West Point and the Western Railway of Alabama, at Montgomery, Ala., has been appointed mechanical assistant to the general manager of the Brazil Railroad Company, in charge of the mechanical department, with office at Sao Paula, Brazil, S. A.

William P. Carroll, terminal foreman of the New York Central & Hudson River, at Buffalo, N. Y., has been appointed master mechanic, with office at Rochester, succeeding F. M. Steele, resigned. J. J. Cunningham, terminal foreman at Gardenville, succeeds Mr. Carroll, and Arthur Dale succeeds Mr. Cunningham.

J. W. Marden, superintendent of the car department of the Boston & Maine, at Boston, Mass., has resigned, and that position has been abolished. E. T. Millar, general foreman of the car department, at Concord, N. H., has been appointed general car inspector, with office at Boston, Mass., succeeding F. S. Sanborn, assigned to other duties.

Purchasing Officers.

John H. Guess, formerly general purchasing agent of the National Railways of Mexico, has been appointed assistant general purchasing agent of the Grand Trunk, with office at Montreal, Que.

C. A. Roth, storekeeper of the Chicago, Burlington & Quincy at Galesburg, Ill., has been appointed a storekeeper at Havelock, Neb. J. L. Feemster, storekeeper at St. Joseph, Mo., succeeds Mr. Roth at Galesburg, and J. A. Allen, general foreman at Aurora, Ill., succeeds Mr. Feemster. J. E. Matthews, chief lumber inspector at Chicago, has been appointed Pacific coast lumber agent, with office at Seattle, Wash., and J. F. Rothschild, storekeeper at Hannibal, Mo., succeeds Mr. Matthews. J. H. Ellis, storekeeper at Lincoln, Neb., succeeds Mr. Rothschild.

OBITUARY.

A. C. Harvey, for the past 15 years district passenger agent of the Great Northern at Philadelphia, Pa., died on February 2, at the home of his son in East Orange, N. J. Mr. Harvey was born at Granville, N. Y., and began railway work in 1863 as a clerk in the passenger department of the Pussumpsic Railway. For 12 years he was traveling freight and passenger agent of the Union Pacific and then he was with the Chicago, Milwaukee & St. Paul two years, before going to the Great Northern.

Henry T. Griffin, assistant general passenger agent of the Chicago, Milwaukee & St. Paul, died February 2, at Chicago. Mr. Griffin was born November 7, 1848, and began railway work in 1868 as a clerk in the accounting department of the Chicago, Milwaukee & St. Paul. He was later a clerk in the general passenger department and was then promoted to chief clerk of the same department. He was appointed assistant general passenger agent in November, 1900. Mr. Griffin was a brother-in-law of Sir Thomas G. Shaughnessy, president of the Canadian Pacific and his son, J. H. Griffin, is general agent of the Canadian Pacific in San Francisco, Cal.

Railway Construction.

New Incorporations, Surveys, Etc.

ARIZONA, MEXICO AND GULF OF CALIFORNIA.—Surveys have been made and contracts for building the line will be let soon. The proposed route is from Sasco, Ariz., southwest to Port Lobos, Sonora, Mex., on the gulf of California. Plans are being made to improve the harbor at Port Lobos to establish extensive port and terminal facilities there. E. H. Parker, chief engineer. (August 5, p. 262.)

ARKANSAS ROADS.—According to press reports, the Board of Trade of Little Rock, Ark., and G. H. Cravens, formerly chief engineer of the Memphis, Dallas & Gulf, at Nashville, are back of a project to consolidate a number of existing lumber roads between Little Rock and De Queen, which are 146 miles apart. About 63 miles of new line will have to be built to complete the line between these two places. G. R. Brown is secretary of the Board of Trade, Little Rock.

ATCHISON, TOPEKA & SANTA FE.—The Sunset Western, it is said, has grading work under way on an extension from Fellows, Cal., north for about two miles.

ATLANTIC, QUEBEC & WESTERN.—This road has been extended from Newport, Que., northeast to Grand River, 17 miles.

AURORA, ELGIN & CHICAGO (Electric).—The lines of this company are to be extended from Yorkville, Ill., west via Plano and Sandwich to Somonauk, and may eventually be extended to Mendota, 66 miles from Aurora.

BADGER RAILWAY & LIGHT CO.—Surveys have been made and rights-of-way secured for a line between Whitewater, Wis., and Lake Geneva, 22 miles. The company will do the work with its own men. G. Pickhard, chief engineer, 710 Majestic building, Milwaukee.

BELLEVILLE & WESTERN.—Incorporated in Illinois, with office at Belleville, Ill., to build from Belleville to a point in Section 9, Township 1, South Range 9, west, in St. Clair county. J. Adami, Centerville; J. D. Vogt, R. W. Hofsommer, P. J. Gundlach and B. A. Gundlach, all of Belleville, are incorporators.

BRITISH COLUMBIA & DAWSON.—A bill has been passed in the Canadian House of Commons, it is said, incorporating this company with a capital of \$10,000,000. The incorporators include: B. Brooks, of the Western Union Telegraph Company, New York; J. W. Kendrick, vice-president of the Atchison, Topeka & Santa Fe, Chicago; W. C. Pratt, A. C. Sullivan, E. C. Harris and C. G. Young, New York, and J. O. Clifford, Chicago.

CUMBERLAND VALLEY.—An officer writes that this company will complete within a few months revision work on the main line for two tracks between Carlisle, Pa., and Greason, 4.84 miles. Five public grade crossings will be abolished. Second track is also being laid from Greason to Newville, 5.26 miles, which it is expected will be finished by the end of this year. All the work is being carried out by the company's men.

GREENVILLE & KNOXVILLE.—This company is planning to make a mortgage to secure funds for building from the present terminus at Riverview, S. C., northwest to Knoxville, Tenn., about 100 miles.

GREENVILLE, SPARTANBURG & ANDERSON (Electric).—See Piedmont & Northern (Electric).

HUDSON & MANHATTAN.—The New York Public Service Commission, First district, has extended the time to June 15, 1913, in which to complete the Ninth street extension of the subway system, from Sixth avenue to Fourth avenue, in the Borough of Manhattan. The work was to have been finished by June, 1911, but has been delayed, pending the adoption of the tri-borough or other system of new subways.

KANAWHA, GLEN JEAN & EASTERN.—A new branch has been opened for business from Sugar Creek Junction, W. Va., to Pax, six miles.

INDIANAPOLIS, NASHVILLE & SOUTHERN TRACTION.—An officer writes that this company has been incorporated in Indiana with \$150,000 capital, to build from Indianapolis, Ind., south via

Bloomington, Bedford, Mitchell and Paoli to Evansville, about 170 miles. The company will do the grading work with its own men. There will be two trestles, one of 1,600 ft., and another of 800 ft., and a 1,000-ft. tunnel. J. A. Johnston, president, and J. A. Shafer, chief engineer, Indianapolis.

LA CROSSE & SOUTHEASTERN.—An officer writes that contracts will be let this coming spring to build an extension from Viroqua, Wis., south via Libertypole, thence southwest to Fargo, then west to West Superior, and continuing south to Retreat, 19 miles. Contracts will also be let for work on eight miles between Wilton and Ontario, including 14 pile bridges. The maximum grades will be 2 per cent. and maximum curvature 6 degrees. Bids will be received by A. E. Rau, engineer, Sparta.

LIDA VALLEY.—According to press reports, surveys are to be started at once for the line from Cuprite, Nev., to a point near Hornsilver, 15 miles, thence west to Lida. Surveys will be continued into the Bishop country. A. D. Goodenow, general manager, and S. W. Connolly is in charge of the survey. (December 23, p. 1204.)

LOUISIANA & ARKANSAS.—An officer writes that permanent location has been made for an extension from Jena, La., east to Natchez, Miss., 50 miles, but it has not yet been determined when the line will be built. (January 6, p. 62.)

MEMPHIS, PARIS & GULF.—An officer writes that this company has located the line from Murfreesboro, Ark., east to Pine Bluff, 166 miles. A contract has been given to the Ware Construction Company, St. Louis, Mo., to build the line and sub-contracts are now being let. The work is to be finished within 12 months. J. H. Allen, chief engineer, Pine Bluff, Ark.

MEXICAN ROADS.—A concession has been given to the Hudson Consolidated, Ltd., an English syndicate, of which Joseph Brailsford, London, England, is chairman, to build about 470 miles of railway through southern Mexico. It is said the government will grant a subsidy of \$5,000,000 gold in aid of the project. Surveys are now being made.

C. Carbonneau, representing the Franco-Espano Bank of Paris and Madrid, which is financing the proposed line to be built by a French syndicate between Comacho, Zacatecas, Mex., and Mazapil, with branch lines to mining camps and other points in the state of Zacatecas, is arranging to start work on the line. Surveys were made some time ago. The main line and branches will total about 300 miles.

MORGAN'S, LOUISIANA & TEXAS.—The new line from Lafayette, La., northeast to Baton Rouge, 57.4 miles, has been opened for business.

MONTGOMERY & CHATTANOOGA.—Incorporated in Alabama with \$50,000 capital, to build from Montgomery, Ala., northeast to Anniston, about 95 miles. The company proposes to first build the 50-mile section from Montgomery to Alexander City, at a cost of \$750,000. Benjamin Russell, president, First National Bank, Alexander City.

MOUNT STERLING SHORT LINE.—Judge H. Clay McKee and O. G. Wales, Toledo, Ohio, are back of a project to build a line either to Paris, Ky., Carlisle or Cynthiana.

NAZAS VALLEY & PACIFIC.—This company has been organized in Mexico to build a line from Tepehuanes, to Guana-cevi, about 62 miles, and a branch will probably be built to Inde, 33 miles. The interest on the bonds of the company is guaranteed by the state of Durango for a period of 25 years. The permanent survey will probably be finished about April 1, and the company hopes that the Sierra Madre mountains will be crossed on a 2 per cent. grade. J. T. Odell, president, New York; J. F. Wallace, vice-president, and A. D. Meloy, secretary.

NEW YORK, ONTARIO & WESTERN.—This company expects to finish this coming fall the double-track work now under way on the Scranton branch, between Scranton, Pa., and Cadosia, N. Y., 54 miles. There remains about 25 miles yet to be double-tracked.

NORFOLK & WESTERN.—A new branch has been opened for business on the Radford division from Salem, Va., to Crusher, 10 miles.

NORTH CAROLINA ROADS.—According to press reports, the Whiting Lumber Company has bought a large amount of timber

lands and will build a line from Tipton, N. C., north to Robbinsville, 12 miles. It is proposed to eventually extend the line from Robbinsville, northwest along the Cheoah river.

NORTHERN PACIFIC.—According to press reports, the Sunnyside branch is to be extended from Grand View, Wash., east to Gibbon, on the main line, about 12 miles.

OKLAHOMA ROADS.—Residents of Ardmore, Okla., will give a bonus of \$100,000 to secure the building of a new line through that place. The projected route is from Lawton, southeast via Duncan and Ardmore, to Sherman, Texas, and the line is to be built within 18 months. The Development Company, Philadelphia, Pa., is back of the project.

PANAMA-DAVID RAILROAD.—It is expected that the Panama assembly will ratify the contract between the Panama government and the Balboa & Pacific Estates, Ltd., of London, England, to build a line from the city of Panama, west to David, about 300 miles. (See Panama Railroad, January 6, p. 62.)

PARRAL & DURANGO.—This road has been extended from Mesa de Sandia, Mex., southward to a point about one-half mile beyond Paraje Seco.

PENNSYLVANIA ROADS (Electric).—According to press reports, plans are being made by residents of Philadelphia, Pa., to build an electric line from Slatington, Pa., northwest to a connection with the Carbon Transit Company at Lehigh, 12 miles. It is said that the work includes putting up a large bridge at Lehigh gap over the Lehigh river, the Lehigh canal and the railway tracks.

PIEDMONT & NORTHERN (Electric).—Incorporated in South Carolina with \$5,000,000 capital. It is understood that the company will take over the rights and property of the Greenville, Spartanburg & Anderson, which was organized to build an electric line between Anderson, S. C., and Spartanburg, about 65 miles, with a number of branch lines. The incorporators include: J. B. Duke, Somerville, N. J., and B. N. Duke, New York. (See North Carolina Roads, January 23, p. 183.)

PITTSBURGH & GREAT LAKES CONNECTING.—Financial arrangements are said to be made to build from Ellwood City, Lawrence county, Pa., northeast to Raymilton, in Venango county, 40 miles. The work will include piercing a tunnel near Jacksonville. It is the intention of the company only to build the first 33 miles from Ellwood City to Grove City at the present time. The estimated cost of the work is \$100,000 a mile. The offices of the company are at Pittsburgh. J. R. Snyder, president, and J. A. Allen, chief engineer.

SAN LUIS SOUTHERN.—Trains are now being operated between Blanca, Colo., and Jaroso, 31.38 miles.

ST. LOUIS, BROWNSVILLE & MEXICO.—The charter of this company has been amended in Texas, permitting the construction of an extension from Buckeye, in Matagorda county, Mex., to Collegeport, 16 miles. This extension has been projected for some time.

SOUTHERN RAILWAY.—An officer writes that the company proposes to double-track the line from Franklin Junction, Va., southerly to the northern terminus of the present double-track at Galveston, 1.4 miles. The contract has been given to Stewart Brothers & Jones, Rockhill, S. C.

SOUTHERN RAILWAY & NAVIGATION COMPANY.—Train service has been extended from Morville, La., to Jeffris, 1.5 miles.

SUNSET WESTERN.—See Atchison, Topeka & Santa Fe.

TEXAS ROADS.—Residents of Bryan, Texas, are back of a project to build from Smitana, on the International & Great Northern, at a point six miles from Bryan, through the Brazos river bottom, about 26 miles. Arrangements have been made for trackage rights over a short section of the International & Great Northern. W. E. Saunders, Bryan, is interested.

VIRGINIA & CAROLINA SOUTHERN.—The Elizabethtown branch has been extended from Dublin, N. C., to Elizabethtown, eight miles.

The Chilean government has appropriated money for the construction on the railway from Valparaiso to Casa Blanca, a small place about 40 miles to the southeast.

Railway Financial News.

ATLANTIC, NORTHERN & SOUTHERN.—This road, which runs from Kimballton, Iowa, south to Villisca, 55 miles, has been put in the hands of a receiver on the application of creditors to the amount of \$100,000. The road, the southerly 38 miles of which was opened to traffic a few weeks ago, was built by farmers living along the line.

BALTIMORE & OHIO.—It is understood that this company is negotiating for the purchase of the Coal & Coke Railway, which runs from Charleston, W. Va., to Leiter, 166 miles, with 24 miles of branches. The company also owns 100,000 acres of coal lands. It has \$18,881,800 stock and \$4,031,000 bonds outstanding.

CAROLINA, CLINCHFIELD & OHIO.—The new directors have been elected: Thomas F. Ryan, Frank A. Vanderlip, John S. Dennis, C. Ledyard Blair, Edward D. Adams, W. K. Whigham and Robert C. Ream.

COAL & COKE.—See Baltimore & Ohio.

GULF, COLORADO & SANTA FE.—This company has arranged for trackage rights over the St. Louis Southwestern's tracks from McGregor, Texas, on the Santa Fe, east to Waco, 20 miles.

HOLYOKE & WESTFIELD.—See New York, New Haven & Hartford.

HUDSON COMPANIES.—See Hudson & Manhattan.

HUDSON & MANHATTAN.—Holders of the \$10,000,000 6 per cent. notes of the Hudson Companies (the holding company for the Hudson & Manhattan), due October 15, 1911, have been given the privilege of extending them until October 15, 1913. The new notes will be secured by the same collateral as the old ones, consisting of \$1,500 Hudson & Manhattan first mortgage 4½ per cent. bonds of 1957 for each \$1,000 note. The notes are convertible into bonds at 85 during 1911, 87½ in 1912, and 90 in 1913. A cash payment of 1½ per cent. on each note will be made to holders accepting the offer.

NEW YORK, NEW HAVEN & HARTFORD.—The Holyoke & Westfield, whose road from Holyoke, Mass., to Westfield, 10 miles, is leased to the New York, New Haven and Hartford, has asked the Massachusetts Railroad Commission for permission to issue \$200,000 4½ per cent. 40-year bonds, dated April 1, 1911, to refund the same amount of first mortgage 4 per cent. bonds due on that date.

NEW YORK, ONTARIO & WESTERN.—The \$2,702,000 general mortgage 4 per cent. bonds of 1955 have been sold to White, Weld & Company, New York (February 3, page 259).

OKLAHOMA RAILWAY (ELECTRIC).—A meeting of the stockholders has been called for February 24 to authorize an increase in capital stock from \$3,000,000 to \$15,000,000, of which \$5,000,000 will be preferred; and to authorize \$12,000,000 bonds. According to the *Commercial & Financial Chronicle*, the new capital is to be authorized in order eventually to build a number of interurban lines.

OREGON ELECTRIC.—White, Weld & Co., New York, are offering at par and interest a block of first mortgage gold 5 per cent. bonds of 1908, of which \$10,000,000 were authorized and \$2,000,000 are outstanding. The company operates 70 miles of road, including the line from Salem, Ore., to Portland, and all of its common stock is owned by the Hill interests.

PITTSBURGH, SHAWMUT & NORTHERN.—William Salomon & Co., New York, and Rhoades & Co., New York, are offering at 97.84 and interest \$875,000 5-year receivers' certificates, dated March 1, 1911. They are issued to refund receivers' certificates due March 1.

ST. LOUIS SOUTHWESTERN.—See Gulf, Colorado & Santa Fe.

TENNESSEE, ALABAMA & GEORGIA.—Under this name the Chattanooga Southern has been consolidated with the projected Chattanooga & Atlanta, and the Gadsden & Birmingham. When construction is finished, the company will have a through line from Chattanooga, Tenn., to Atlanta, Ga., via the Seaboard Air Line from Rockmart, Ga. The *Commercial & Financial Chronicle* says that the authorized capital stock of the new company will be \$2,350,000 common and \$750,000 preferred. A

mortgage securing an issue of \$5,000,000 first mortgage 5 per cent. 50-year bonds, dated February 1, 1911, has been made to the Empire Trust Company of New York. (December 23, p. 1206.)

WABASH-PITTSBURG TERMINAL.—The Guaranty Trust Company and Sutro Brothers & Co., have jointly bought \$1,000,000 receivers' certificates issued to pay for 1,000 steel cars, which are about to be ordered. This issue is part of \$2,000,000 previously authorized, and the remaining \$1,000,000 may be issued for buying more cars when necessary.

WHEELING & LAKE ERIE.—The \$8,000,000 5 per cent. notes held by the syndicate headed by Kuhn, Loeb & Company, have been extended for 18 months by an agreement between the railway and the syndicate.

WINSTON-SALEM SOUTHBOUND.—The Union Trust Company, Pittsburgh, Pa., is offering at 95½ a block of first mortgage 50-year 4 per cent. bonds, dated July 1, 1910, being part of an authorized issue of \$5,000,000, all of which is outstanding. The bonds are secured on 89 miles of road from Winston-Salem, N. C., to Wadesboro, and are guaranteed, principal and interest, jointly and severally, by the Norfolk & Western and the Atlantic Coast Line, each of which owns half the capital stock. This stock is also deposited as security.

FOREIGN RAILWAY NOTES.

At the beginning of this year there were 63 organizations in the German Railway Union, having in the aggregate 67,128 miles of railway, the Prussian State Railway leading, with 23,418 miles, while one other German road has less than 4 miles. Austria had 12,664 miles in the Union; Hungary, 11,388; besides 1,995 belonging to Austria and Hungary jointly. The other lines are chiefly in Holland and Roumania, and one in Russia. The mileage increased 1,138 miles during last year. In the last ten years it has increased 10,131 miles, or nearly 15 per cent.

A member of the Italian Parliament, Prof. Ancona, of the Milan Polytechnic, has published some figures which indicate that Italy is not making money very fast by its railways. The report of the railway department indicated a profit of \$7,400,000 in the last year reported, but this critic says that this was because certain expenses incurred by the railway had by law been made chargeable to the general treasury, and that the actual profits for the last four years have been \$8,600,000, \$7,400,000, \$3,200,000 and \$860,000, respectively. The state's investment in these railways, it should be remembered, is about \$1,000,000,000.

The Portuguese railway employees won their recent strike and obtained the following concessions from the companies: The lowest wages will be increased about 20 cents a day; all the employees will receive a yearly vacation of 20 days, during which time they will receive full pay; a nine-hour day rule will be rigidly kept; the amounts of the pensions will be revised; all employees will be given passes and the period of the strike will be regarded as vacation, the strikers receiving full pay. At first all of the demands of the strikers were refused, but the companies offered a 10 per cent. wage increase. This was rejected as unsatisfactory. Work was taken up on January 15 and express trains were to be run a day or two later.

Passenger rates on Belgian railway lines per mile are about 3 cents first class, 2 cents second class, and 1 cent third class. In Germany the average passenger rates are 2.7 cents, 1.7, and 1 cent, respectively, and in France, 3.1, 2.3, and 1.5 cents, respectively. In Russia rates are somewhat lower, but this advantage in the cost of travel is offset by the slowness and fewer conveniences of traveling. Italian rates are somewhat higher, but the highest in Europe are those of England, ranging from 4 cents to 5.8 cents per mile first class, to 3.7 cents per mile second class, and 1.9 to 2.9 cents third class. In Belgium the comparatively cheap mode of transportation offered through cheap commutation tickets, "abonnements," unquestionably stimulates travel, and probably causes the large volume of passenger traffic on the lines of this country. These tickets can be purchased for periods of 5 and 15 days, 12, 9, 6, and 3 months, and during the period for which the ticket is issued the holder has the right to travel at any time, on any train that suits his convenience, without regard to the distance traveled, within Belgian territory.

Late News.

The items in this column were received after the classified departments were closed.

The Brinson Railway has ordered 50 sixty-ton box cars from the American Car & Foundry Company.

E. T. Stotesbury has been elected a director of the Lehigh & Hudson River, succeeding the late J. Rogers Maxwell.

Archibald T. Banning has been elected secretary of the Duluth, Missabe & Northern, succeeding E. B. Ryan, Jr., resigned.

Charles H. Markham, president of the Illinois Central, with office at Chicago, has been elected also president of the Central of Georgia and the Ocean Steamship Company of Savannah, succeeding Major J. F. Hanson, deceased.

C. A. How, supply agent of the Missouri Pacific, at St. Louis, Mo., has been appointed general purchasing agent, with office at St. Louis, succeeding S. F. Pryor, resigned to become vice-president of the Simmons Hardware Company.

The directors of the Boston & Maine have approved the action recently taken for the eventual construction of a line for the Boston & Maine on the New Hampshire side of the Connecticut river, extending about 11 miles north of Hinsdale, N. H.

The Arizona & New Mexico has filed notice of an increase in its capital stock from \$1,500,000 to \$2,300,000; the additional sum is to be used for extensions and betterments. The line now extends from Lordsburg, Grant county, N. Mex., to Clifton, Ariz.

Major Melville W. De Wolf, vice-president of the Erie Railroad, died February 8, in New York City, at the age of 77 years, from heart failure brought on by an attack of asthma. He began railway work in 1873 as agent of the Erie & Pacific Dispatch, at New York. In May, 1893, he was appointed general eastern freight agent of the Erie Railroad, and on June 1, 1908, he was appointed special agent. In November of the same year he was made a vice-president of that company, which office he held at the time of his death.

Congressman Macon, of Arkansas, has introduced a bill providing that it shall be unlawful for any company, corporation, organization, or association engaged in interstate or foreign commerce to use the mails, telegraph or telephone lines, or the railways within the jurisdiction of the United States for purposes of interstate or foreign commerce without first having filed with the Interstate Commerce Commission an affidavit duly subscribed and sworn to by the chief agent or officer thereof, clearly setting forth that the aggregate value represented in and by the stocks, bonds, or other securities of the company does not exceed the aggregate physical value of the property and the reasonable value of the business, privilege, or franchise that the said stocks, bonds, or other securities were issued to represent.

The Commerce Court was organized at Washington on Wednesday, in the conference room of the Court of Custom Appeal, Martin A. Knapp, presiding judge, acting as chairman. The other members of the court, John E. Carland, Robert W. Archbald, William H. Hunt and Julian W. Mack, were all present. The court will open for business at noon on Wednesday, February 15, at which time cases now pending in other courts that properly are to be adjudicated before the new court will be automatically transferred. The following officers were appointed: Clerk, G. F. Snyder, salary, \$4,000; deputy clerk, W. S. Hinman, salary, \$2,500; marshal, F. J. Starek, salary, \$3,000; deputy marshal, J. L. Murphy, salary, \$2,500. Mr. Snyder was secretary to Senator Elkins and is clerk of the State Committee on Interstate Commerce. He is a lawyer and is well known among railway officers. Mr. Hinman has been attached to the confidential clerical staff of the White House for many years. Mr. Starek is connected with the internal revenue bureau, having for a long time served as chief clerk. Mr. Murphy is chief of a division of the Interstate Commerce Commission.

Supply Trade Section.

The Detroit United Railway Company has ordered 60 two-motor 70-h.p. car equipments from the General Electric Company, Schenectady, N. Y.

The W. K. Kenly Company, Chicago, announces the appointment of the Railway Signal Company of Canada, Ltd., Montreal, Que., as general agents for Canada.

Edward Beers, secretary of the Commercial Acetylene Company, New York, left on February 3 for an extended trip in Canada. The company has an office and charging station at Toronto, Ont.

George Moses, eastern and southern representative for James B. Sipe & Co., Pittsburgh, Pa., died in Pittsburgh, January 15. Mr. Moses was for a number of years actively engaged in railway work, and previous to 1907 held a responsible position in the office of Alexander Stewart, general superintendent of motive power of the Southern Railway.

A. C. Moore, district manager of the Safety Car Heating & Lighting Company, New York, with headquarters in Chicago, was on February 1 made general manager, in charge of the commercial interests of the company, with headquarters in New York. Mr. Moore is succeeded in Chicago by J. G. Van Winkle as general agent in charge of the northwestern district.

The Pennsylvania Railway Motor Company has been incorporated in Pennsylvania by J. A. Viele, Frank M. Knapp, O. W. Ensworth and R. W. Brown. The company will make cars, engines, boilers, machinery, etc. It is capitalized at \$200,000. The Viele motor car will be the principal product of this company and, when complete, the plant will have a capacity of one of these cars per month. These cars will be similar to the one Mr. Viele has been working on for many months, and which is understood to have undergone several tests on the Pennsylvania Railroad tracks. Work will be begun on the plant immediately.

The Linde Air Products Company, Buffalo, N. Y., has increased its capital from \$500,000 to \$1,000,000. The company has purchased sites at South Elizabeth, N. J., and North Trafford, Pa., and is proceeding at once with the erection of two large factories. It is anticipated that these two new plants will be completed and in operation by next June. Contracts have been let for the buildings and for such equipment as the company does not make at its Buffalo shops. The company already has two plants in operation—one in Buffalo and one in East Chicago—but has found that it needs these additional oxygen plants.

Eugene P. Thomas, assistant to former president James A. Farrell of the United States Steel Products Company, New York, has been elected president of this company to fill the vacancy caused by Mr. Farrell's election to the presidency of the United States Steel Corporation. Mr. Thomas has had a wide experience in the export branch of the steel trade, having been in London from 1899 to 1903, as foreign representative of the Lorain Steel Company, Philadelphia, Pa., the American Steel & Wire Company, Cleveland, Ohio, and the Illinois Steel Company, Chicago. When these companies were taken over by the United States Steel Corporation, Mr. Thomas came to New York to take charge of a department of the United States Steel Products Company.

John I. Beggs, president of the Milwaukee Electric Railway & Light Company was elected president of the St. Louis Car Company, St. Louis, Mo., at the recent annual meeting. This was the first annual meeting of the corporation since its reorganization by Mr. Beggs. The directors elected are: John I. Beggs, Robert McCullough, Richard McCullough, George J. Kobusch and Warnes S. McCall. The officers are: President, John I. Beggs; chairman of the board of directors, George J. Kobusch; secretary and treasurer, J. M. Taylor. Edwin Missner, chief clerk of the Milwaukee Electric Railway & Light Company at Milwaukee, has been appointed assistant to the president. The company has paid off all indebtedness and has now a working capital of \$400,000.

Annual Baseball Game at the Atlantic City Convention.

Charles A. Knill, chairman of the baseball committee of the Railway Supply Manufacturers' Association is already making plans for the annual game at Atlantic City, N. J., during the conventions of the Master Mechanics' and the Master Car Builders' Associations. In order to give aspirants for places on the teams an opportunity to find out if they can qualify, the following eligibility rules have been framed:

(1) Each team to be composed of 12 men in uniform, eight railway supply men and four railway men.

(2) Supply men must be in the sales departments of their companies, or call on railways or car companies to solicit business.

(3) No one who is employed in a shop alone will be allowed to play.

(4) No one is to be allowed to play who comes to Atlantic City for the baseball game alone. Each player must be in attendance as a representative of a supply company and registered as such.

(5) Railway men to play must be members of either the M. M. or M. C. B. association. Employees in shops cannot play.

(6) Members' names and occupations, and the names of the supply concerns or railways with which they are connected must be submitted to J. Will Johnson, chairman of the entertainment committee, at least one month before the game.

(7) If for any reason a change in team is necessary, names shall be submitted and passed on by the sub-chairman of the baseball committee as well as by Mr. Johnson.

(8) No player shall be eligible who has not been employed as salesman for at least one year by a railway supply company, or who has not been a member of the M. M. or M. C. B. association for at least one year.

All players who can meet these requirements are requested to write soon to either Harry B. Hammond, Pressed Steel Car Company, Pittsburgh, Pa., who will captain the western team, or F. M. Nellis, 53 State street, Boston, Mass., who will captain the eastern team, so as to give them time to select their teams. Pittsburgh, Pa., will be in western territory and Buffalo, N. Y., in eastern.

TRADE PUBLICATIONS.

Rock Drill Accessories.—The Ingersoll-Rand Company, New York, in bulletin 9003, describes and illustrates its rock drill accessories.

Finished Steel.—The Carnegie Steel Company, Pittsburgh, Pa., has published Stock List No. 6 of the Waverly warehouses, Newark, N. J., giving all the various products on hand and the code words for use in telegraphic orders.

Interlocking Machines.—The General Railway Signal Company, Rochester, N. Y., has published a catalog on model 2 electric interlocking machines. This catalog contains over 50 pages, is illustrated and gives diagrams and full information on this line.

Cranes.—The Northern Engineering Works, Detroit, Mich., has devoted its catalog No. 25 to photographs and brief descriptions of all the various types of Northern cranes. Appended to each description is a note giving the number of the catalog which is devoted to that particular design.

Electrical Fittings and Generators.—The Sprague Electric Company, New York, has published catalog No. 436, giving a full list of electrical fittings and accessories. Illustrations and prices are included. Bulletin No. 111 of this company illustrates the various types of electric generators and gives a long list of the plants in which they are installed.

Train Despatching.—The United States Electric Company, New York, has published Bulletin No. 501 on Gill selectors for telephone train despatching, describing the development of the selective calling system particularly in its application to railway telephony, and explaining fully the functions and service of the Gill selector and the answer-back.

Missouri Pacific.—"Under Sapphire Skies in San Antonio" gives the prospective traveler a good idea of the attractions of this old Texas City and other points reached by the Missouri Pacific-Iron Mountain route. Another booklet by the same passenger department describes Hot Springs, Ark., as "The Natural Wonderland Set Apart by the Nation for the Health and Pleasure of the People."

Western Pacific.—"Where's Where and How to Get There," is the title of the latest ticket agents' manual of the Western Pacific. A large map and details of connections give the information suggested in the title. Another booklet issued by the road is called "Seeing the Western Pacific." Taking the important towns in order from Salt Lake City, Utah, to San Francisco, Cal., this publication briefly outlines the interesting facts regarding each community.

Electric Railways and Air Brakes.—Bulletin No. 4808 of the General Electric Company, Schenectady, N. Y., is a reprint of an article on the Washington, Baltimore & Annapolis 1200-volt direct current railway, which appeared in the *General Electric Review*. It is illustrated with photographs and diagrams, and gives detailed information on this inter-urban line. Bulletin No. 4798 illustrates and describes General Electric straight air brake equipments for electric railways.

Safety Valves.—The Crosby Steam Gage & Valve Company, Boston, Mass., has published two catalogues on locomotive pop safety valves; one giving the construction of their standard type open and muffled valves, and the other giving a report on tests of 3 in. and 3½ in. valves as submitted by Prof. F. E. Miller, of the Massachusetts Institute of Technology. These tests were made as complete as possible. The results give data that is interesting and instructive from an engineering standpoint, especially that obtained from the valves with the inner edge of the main discharge slightly rounded.

Generators, Alternators and Air Compressors.—Bulletin No. 4804 of the General Electric Company, Schenectady, N. Y., is devoted to direct connected generating sets, which are used for both power and lighting in isolated plants and also as exciters for alternating current generators in central station work. Bulletin No. 4685 describes belt-driven alternators. These alternators are of the revolving field type and range in capacity from 30 to 550 k.w. Photographs, dimension diagrams and descriptions give full information on this line. Bulletin No. 4810 illustrates and describes portable and stationary air compressor sets. The portable air compressors are mounted on three-wheel trucks, which can easily be moved from one place to another, and were designed for use where the installation of a system of piping is not feasible.

RAILWAY STRUCTURES.

CENTRALIA, WASH.—The Northern Pacific will begin work in the spring on a large roundhouse and repair shops. The yard trackage will also be increased.

EAGLE LAKE, TEXAS.—The Gulf, Colorado & Santa Fe will build a brick combination passenger station and freight house for which bids will be taken at once. The building is to cost between \$8,000 and \$10,000.

EVANSVILLE, IND.—The Louisville & Nashville will build track repair shops at a cost of \$140,000.

FT. WAYNE, IND.—The Wabash has prepared plans for a new passenger station, but they will have to be reconsidered on account of the refusal of the city to vacate the necessary ground.

GALVESTON, TEXAS.—The Atchisb'n, Topeka & Santa Fe has included in its 1911 budget the following improvements for Galveston and vicinity: A new 16-stall brick and concrete engine house, to cost \$40,000, and a quantity of machine tools for equipping this engine house; extensive yard improvements and the moving of a number of the yard buildings.

GAS CITY, IND.—The Pennsylvania Lines West are revising the plans for a one and one-half story brick passenger station to be built at a cost of about \$15,000.

GRAND ISLAND, NEB.—The Chicago, Burlington & Quincy has completed plans for a new passenger station between Fifth and Seventh streets, and the city council has voted to vacate the necessary property.

HUGUENOT, N. Y.—The New York Public Service Commission, First district, has ordered the elimination of grade crossings on the Staten Island Rapid Transit in Amboy road, near Huguenot avenue, Staten Island.

JAMESTOWN, N. Y.—The New York Public Service Commission, Second district, has ordered the elimination of three grade crossings on the Erie Railroad at Jamestown, at a cost of \$560,000. The railway company is to pay one-half, the city one-quarter and the state one-quarter of the cost.

KALAMAZOO, MICH.—The Michigan Central has let a contract to H. L. Vanderhoist, Kalamazoo, for building its new freight house, which is to cost about \$28,000.

MINOT, N. D.—The Minneapolis, St. Paul & Sault Ste. Marie expects to begin work in the spring on a passenger station to cost about \$100,000. It will be located between Main and Reishus streets.

MOBILE, ALA.—Plans have been made for the construction of a new passenger and freight station, it is said, by the New Orleans, Mobile & Chicago, at Mobile, on which work is to be started soon. The station is to be built on the block bounded by Royal, St. Emanuel, Charleston and Augusta streets. The company proposes to lay double tracks from Tennessee street to the new terminal, which will be in the business center of the town.

MOLINE, ILL.—The Chicago, Burlington & Quincy, has prepared plans for a new passenger station, but is holding the plans in abeyance during negotiations between the Burlington, the Chicago, Rock Island & Pacific, the Chicago, Milwaukee & St. Paul and the Davenport, Rock Island & Northwestern for building a union station.

MONTALVO, CAL.—Recent rains have damaged the concrete piers of the Southern Pacific steel bridge over the Santa Clara river near Montalvo.

NEW HAVEN, CONN.—According to press reports, revised plans have been made for the new union station in New Haven, and work on the structure will be started soon. (December 23, p. 1208.)

OMAHA, NEB.—Fire in the yards of the Chicago, St. Paul, Minneapolis & Omaha on February 1 destroyed a storehouse containing a quantity of locomotive supplies. The oil house, coal chute and yard office were also damaged.

PEORIA, ILL.—The Illinois Traction System plans to build a one-story brick freight house 63 ft. x 130 ft.

PORT MANN, ORE.—The Canadian Northern has begun work on the town site of its new Pacific terminal to be known as Port Mann. A tract of 4,000 acres, having a water front of 2½ miles, has been surveyed and a large force of men is engaged in the preliminary work of leveling the site and building the company's car shops and foundries.

SHERMAN, TEXAS.—The Houston & Texas Central will extend its yard mileage, and the building of an emergency car shop is contemplated.

ST. JOHN, N. B.—The Canadian Pacific is planning to build terminals on land recently bought at the head of the harbor. The company expects to put two steamers on the Bay of Fundy instead of the one now there, and the new terminals are intended to care for the increased traffic.

THE DALLES, ORE.—The Oregon-Washington Railroad & Navigation Company has prepared plans for a \$30,000 passenger station, but its location has not been decided on.

TULSA, OKLA.—The St. Louis & San Francisco has agreed with the city on the details of a plan for building a subway at an estimated cost of \$100,000.

VANCOUVER, WASH.—The Spokane, Portland & Seattle is contemplating building elevators and docks to cost about \$2,000,000 at a point 3½ miles below the city.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Wheeling & Lake Erie is in the market for 4 Mallet locomotives.

The Brompton Pulp & Paper Co., Sherbrooke, Que., has ordered 1 Forney type locomotive from the Montreal Locomotive Works. The cylinders will be 14 in. x 22 in., and the total weight in working order will be 50,000 lbs.

The Florida East Coast has ordered 5 Pacific type locomotives from the American Locomotive Company. The cylinders will be 20 in. x 26 in., the diameter of the driving wheels will be 68 in. and the total weight in working order will be 196,000 lbs.

The Hocking Valley has ordered 10 consolidation locomotives from the American Locomotive Company. The cylinders will be 23 in. x 30 in., the diameter of the driving wheels will be 57 in. and the total weight in working order will be 237,000 lbs.

The Pittsburg, Summerville & Clarion has ordered 1 consolidation locomotive from the American Locomotive Company. The cylinders will be 20 in. x 26 in., the diameter of the driving wheels will be 57 in. and the total weight in working order will be 162,000 lbs.

The Marion & Rye Valley, Marion, Va., has ordered 1 consolidation locomotive from the American Locomotive Company. The cylinders will be 21 in. x 24 in., the diameter of the driving wheels will be 46 in., and the total weight in working order will be 142,000 lbs.

The Texas City Transportation Company, Texas City, Texas, has ordered 1 mogul locomotive from the American Locomotive Company. The cylinders will be 17 in. x 24 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 94,000 lbs.

The Pennsylvania, it is said, will build the frames and the running gear of 20 2,000-h.p. electric locomotives at its Juniata shops. The brakes and the motor equipment for these locomotives will be made by the Westinghouse Electric and Manufacturing Company. This is not confirmed.

The Kanawha & Michigan has ordered 8 consolidation locomotives and 2 six-wheel switching locomotives from the American Locomotive Company. The cylinders of the consolidation locomotives will be 23 in. x 30 in., the diameter of the driving wheels will be 57 in. and the total weight in working order will be 237,000 lbs. The cylinders of the switching locomotives will be 20 in. x 26 in., the diameter of the driving wheels will be 50 in. and the total weight in working order will be 130,000 lbs.

The Harriman Lines have ordered 196 locomotives from the Baldwin Locomotive Works, as mentioned in the *Railway Age Gazette* of February 3. The locomotives will be apportioned as follows: Union Pacific, 30 mikado freight, 10 mikado passenger, 10 switch; Oregon Short Line, 15 mikado freight; Central Pacific, 6 mikado freight, 6 consolidation, 6 switch, 12 Mallet consolidation, 12 Mallet mogul, 2 eight-wheel passenger; Southern Pacific, 3 eight-wheel passenger, 6 switch; Oregon & California, 10 mikado freight, 2 switch; Oregon-Washington Railroad & Navigation, 40 mikado freight, 10 switch, 2 Pacific; Galveston, Harrisburg & San Antonio, 6 ten-wheel passenger, 2 switch; Morgan's Louisiana & Texas, 2 switch; Texas & New Orleans, 2 switch; Arizona Eastern, 2 consolidation. Of this number, the following locomotives will be lignite burners: 80 of the mikado freight; all of the mikado passenger; and all of the Pacific. The lignite burners will be equipped with 9,000-gal. rectangular tenders, having a coal capacity 5 tons greater than the standard tender, as it has been found that the capacity of the standard tender is not great enough where lignite is burned. Two extra tenders are included in the order for the Southern Pacific of Mexico. These will have a capacity of 7,000 gal., and will be of the cylindrical type. All of the Mallets have semi-cylindrical tenders with a capacity of 10,000 gal. of water and 3,200 gal. of oil. The following dimensions are for all the locomotives in the respective classes: mikado freight, drivers, 57 in., cylinders 23¾ in. x 30 in., weight on drivers 195,000 lbs.; consolidation, all dimensions conform to Harriman Lines standard: mikado pas-

senger, drivers, 63 in., cylinders, 26 in. x 28 in., weight on drivers, 210,000 lbs.; Mallet consolidation (2-8-8-2), drivers, 57 in.; cylinders, 26 in. and 40 in. x 30 in., weight on drivers, 394,000 lbs.; Mallet mogul (2-6-6-2), drivers, 63 in., cylinders, 25 in., and 38 in. x 28 in., weight on drivers, 320,000 lbs.; ten-wheel passenger drivers, 63 in., cylinders, 22 in. x 28 in., weight on drivers, 160,000 lbs.; Pacific, drivers, 77 in., cylinders, 25 in. x 28 in., weight on drivers, 170,000 lbs.; eight-wheel passenger, drivers, 73 in., cylinders, 20 in. x 26 in., weight on drivers 100,000 lbs.; switch, all dimensions conform to Harriman Lines standards. Delivery on these locomotives is to begin April 1.

CAR BUILDING.

The Wheeling & Lake Erie is in the market for 500 flat cars.

The Lehigh Valley is said to have ordered 15 milk cars. This is not confirmed.

The Great Northern has ordered 75 tank cars from the Pressed Steel Car Company.

The Lehigh & Hudson has ordered 6 flat cars from the Standard Steel Car Company.

The Atlanta & West Point has ordered 100 flat cars from the American Car & Foundry Company.

The Wabash-Pittsburg Terminal will place an order shortly for 1,000 70-ton steel hopper coal cars.

The Minnesota, Dakota & Western, International Falls, Minn., is taking prices on from 50 to 60 41-ft. 40-ton flat cars.

The Pennsylvania will build at its Altoona shops, 1,000 gondola cars, 50 suburban passenger cars, 9 dining cars and 7 postal cars.

The Buffalo, Rochester & Pittsburgh, mentioned in the *Railway Age Gazette* of December 9 as preparing specifications on from 1,500 to 2,000 freight cars, is said to have withdrawn these inquiries.

The Central of Georgia, mentioned in the *Railway Age Gazette* of January 20 as intending to build 300 freight cars, is said to have ordered 250 car frames from the Standard Steel Car Company. This is not confirmed.

The New York Central Lines, it is said, are building 35 steel mail cars at their shops. Fifty more will be built as soon as the capacity of the shops will permit. This is not confirmed.

The Pittsburg & Shawmut has ordered 1,500 fifty-ton twin-hopper all-steel coal cars, 500 fifty-ton steel gondola coal cars, 50 forty-ton steel flat cars, 50 thirty-ton steel underframe box cars, and 15 caboose cars. The American Car & Foundry Company will build the hopper cars, the box cars and the caboose cars, and the Pressed Steel Car Company will build the gondola cars and the flat cars.

IRON AND STEEL.

Isthmian Canal Commission will receive bids until February 16, on miscellaneous supplies, including reinforcement steel bars, manganese castings, ingot copper, steam whistles, etc. Circular No. 621-A.

The New York, New Haven & Hartford and the Boston & Maine have ordered 61,000 tons of rails as follows: 15,000 tons from the Lackawanna Steel Company; 15,000 from Bethlehem Steel Company, and 31,000 from the Pennsylvania Steel Company.

General Conditions in Steel.—Recent bookings have been in excess of the actual rate of production, a condition which the trade has not seen for almost a year. As a result, the output will be increased to 70 per cent. of the capacity as against 45 per cent. in operation during the last week in January. The steady increase in the buying momentum has finally put a stop to all talk of prospective price reductions. Fear is expressed among some conservatives that the improvement is only temporary, but the rail orders already placed, assure the mills a larger total tonnage for the first half of 1911 than was shown for the last half of 1910.